Regional analysis of public capital expenditure: to which regions is public capital expenditure channelled – to "rich" or to "poor" ones?

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Postprint / Postprint
Zeitschriftenartikel / journal article

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Journal:	*Regional Studies*
Manuscript ID:	CRES-2008-0070.R2
Manuscript Type:	Main Section
JEL codes:	E61 - Policy Objectives; Policy Designs, Consistency, Coordination < E6 - Macro Policy Formation, Macro Public Finance, Macro Policy, etc < E - Macroeconomics and Monetary Economics, H5 - National Government Expenditures and Related Policies < H - Public Economics, R11 - Regional Economic Activity: Growth, Development, and Changes < R1 - General Regional Economics < R - Urban, Rural, and Regional Economics, R58 - Regional Development Policy < R5 - Regional Government Analysis < R - Urban, Rural, and Regional Economics
Keywords:	regional impact of non-regional policies, sectoral policies, territorial impact assessment, regional policy, public investment, Czech Republic

Regional analysis of public capital expenditure: to which regions is public capital expenditure channelled – to "rich" or to "poor" ones?

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Received March 2008: in revised form October 2008

Abstract

The paper aims to contribute to the debate on the regional dimension of sectoral (i.e. non-regional) policies and to empirically demonstrate the huge discrepancy between both the volume and the regional pattern of sectoral public capital expenditure policies on the one hand, and official regional policy on the other. The analyses were based on a unique database of public investment in the Czech Republic covering the years 1995–2005. Their results show significant conflicts in policy objectives and thus represent a clear argument in favour of pursuing territorial impact assessment (TIA) of sectoral policies.

Key words: regional impact of non-regional policies, sectoral policies, territorial impact assessment, regional policy, public investments, Czech Republic

Une analyse des dépenses en capital publiques: vers quelles régions les dépenses en capital publiques sont-elles canalisées – vers les régions riches ou les régions pauvres?

Cet article cherche à contribuer au débat sur la dimension régionale des politiques sectorielles (c'est-à-dire, qui ne sont pas à but régional) et à démontrer de façon empirique l'écart sensible entre le volume et la distribution régionale des politiques sectorielles pour ce qui concerne les dépenses en capital publiques d'un côté, et la politique régionale officielle de l'autre côté. Les analyses sont fondées sur une base de données unique sur l'investissement public en République tchèque de 1995 à 2005. Il s'avère d'importants conflits entre les objectifs de politique, et les résultats représentent donc un argument clair en faveur de la poursuite d'une étude de l'impact territorial des politiques sectorielles.

Impact régional des politiques qui ne sont pas à but régional / Politiques sectorielles / Etude de l'impact territorial / Politique régionale / Dépenses publiques en capital / République tchèque

Regionalanalyse öffentlicher Investitionen: In welche Regionen werden öffentliche Investitionen gelenkt – in 'reiche' oder 'arme'?

Mit diesem Artikel möchten wir zur Debatte über die regionale Dimension sektoraler (d. h. nicht-regionaler) Politiken beitragen und empirisch nachweisen, dass zwischen dem Volumen und regionalen Muster sektoraler öffentlicher Investitionspolitiken einerseits und der offiziellen Regionalpolitik andererseits eine gewaltige Diskrepanz besteht. Die Analysen stützten sich auf eine einzelne Datenbank öffentlicher Investitionen in der Tschechischen Republik in den Jahren von 1995 bis 2005. Die Ergebnisse lassen auf signifikante Konflikte hinsichtlich der politischen Ziele schließen und stellen somit ein klares Argument für eine Untersuchung der territorialen Auswirkungen sektoraler Politiken dar.

Key words:

Regionale Auswirkungen nicht-regionaler Politiken Sektorale Politiken Untersuchung territorialer Auswirkungen Regionalpolitik Öffentliche Investitionen Tschechische Republik

Análisis regional de inversión de capital público: ¿A qué regiones se canaliza la inversión de capital público: a las 'ricas' o a las 'pobres'?

Abstract
El objetivo de este artículo es contribuir al debate sobre la dimensión regional de políticas sectoriales (es decir, no regionales) y demostrar empíricamente las enormes discrepancias entre el volumen y el modelo regional de las políticas de inversión de capital público sectorial, por una parte, y la política regional oficial, por otra. Los análisis se han fundamentado en una única base de datos de la inversión pública de la República Checa que abarca los años 1995–2005. Sus resultados muestran conflictos significativos en objetivos políticos y, por tanto, representan un claro argumento a favor de obrar con arreglo a una evaluación del impacto territorial de las políticas sectoriales.

Key words:
Impacto regional de políticas no regionales Políticas sectoriales Evaluación del impacto territorial Política regional Inversiones públicas República Checa

JEL classifications: H5, E61, R 11, R 58

1. Introduction

The aim of the paper is to contribute to the debate on the regional dimension and the regional impact of sectoral public capital expenditure policies. This debate started decades ago (e.g. SHORT, 1978; BENNETT, 1980; MARTHUR and STEIN, 1980; MOLLE and CAPPELLIN, 1988) but recently received a significant impetus in the form of a discussion on the regional impact of sectoral policies and the possibilities of their "regionalization" (e.g. DG RESEARCH, 1991; MARTIN, 1999; ROBERT *et al*., 2001; MOLLE, 2007). The "regionalization" of sectoral policies can be understood as the fine-tuning of sectoral public expenditure according to the needs and circumstances of specific regions.[1] One of the important results of this discussion was the gradual development of the methodology of the territorial impact assessment of large projects and later, also of programmes and policies – SCHINDEGGER and TATZBERGER, 2003; CAMAGNI, 2006). The increasing attention being paid to the regional dimension of public expenditure policies stemmed originally from the effort to learn how to improve or - more precisely - how to ensure the coordination of the territorial impact of the EU policy of economic and social cohesion (ESC) and of other European policies (e.g. CEC, 1996; SHOUT and JORDAN, 2007). Moreover, at the same time, there was a significant research endeavour to discover to what extent the regional impact of ESC policy has been in compliance with the spatial effects of numerous national public policies of the EU Member States (CEC, 2004).

[1] Such fine-tuning can take many different forms, for example differentiation of the form and the rate of public support or the involvement of regional self-government or other regional bodies in decision-making procedures, although in practice such an approach is rather rarely applied.

Nevertheless, the number of existing analyses of the regional impact of sectoral policies is still relatively limited (for exceptions see e.g. HEALD, 1994; AUTERI and COSTANTINI, 2004; KATAOKA, 2005; MACEŠKOVÁ, 2007), mostly due to the severe data limitations in most countries. Therefore, the main aim of this article is an attempt to perform an analysis of the regional dimension of public capital expenditure in one of the new Member States (the Czech Republic) at the level of the NUTS 3 and 4 regions. This analysis is based on a unique data set of capital public expenditure covering investment projects supported during 1995–2005.

The analyses undertaken here are aimed at answering several research questions. Firstly, the relation between the level of the socio-economic development of the regions and the amount of invested public capital expenditure will be investigated. It is assumed that public investments are highly concentrated in the most socio-economically developed regions. Such a regional allocation of this type of public funds would be in accordance with the principles of a strategic regional policy (for more on strategic regional policy see e.g. GORZELAK, 1992). In other words, given the many deficiencies in the sphere of the technical and other infrastructures inherited from the communist period, it is supposed that public investment was primarily focused on the enhancement of the infrastructure in major cities and namely in Prague to strengthen the gateway effect (DRBOHLAV and SÝKORA, 1997) and to enhance the competitiveness of the national metropolis on the international scene.

Moreover, another reason for the anticipated concentration of public investment in core regions is the assumed higher efficiency of investment in these regions (e.g. CAMINAL, 2004; DE LA FLUENTE, 2004). Therefore, a positive correlation between the level of socio-economic development and the amount of public capital invested (relative per capita) is expected. However, it should be stressed that such a regional pattern of public investment contradicts the objectives of the Czech national strategy for regional development and of

regional policy aiming at decreasing regional disparities and being in compliance with the "insurance" type of regional policy (MRD, 2006; GORZELAK, 1992). As a result, it can be argued that there is an immense policy conflict between goals of explicit regional policy and mostly unintended spatial impacts of much more vigorous non-regional governmental policies. Therefore, our analyses might also serve as empirical support for the importance of pursuing territorial impact assessment (TIA), both for major public capital projects and for sectoral policies as a whole.

Secondly, a replication of the traditional East-West gradient of socio-economic development by the regional structure of capital expenditure is also expected (for more on the East-West gradient, see BLAŽEK and CSANK, 2007).

Obviously, given the fact that public capital expenditure is highly "visible", the allocation is inevitably subject to challenge in the political arena, and a significant role of subjective and "soft" factors in the regional allocation of this expenditure is envisaged. Despite the fact that the available data does not allow for a thorough explanation of the obtained result, the potentially most important explanatory factors are identified.

Finally, it is believed that a detailed scrutiny of the regional structure of public expenditure significantly helps our understanding of regional development.

The paper is structured as follows. Firstly, the theoretical debate and the most important findings of previous studies are summarized. Next, the data and the methodology are described. Thirdly, the main findings of the empirical analyses of public capital expenditure on the NUTS 3 and NUTS 4 levels are provided and discussed. Finally, conclusions and policy implications are drawn.

2. Regional impact of government policy and its sectoral policies

The subject of public finance and fiscal policy is an important and traditional sphere of research for economists (e.g. MUSGRAVE and MUSGRAVE, 1973; ATKINSON and STIGLITZ, 1980), nevertheless, geographers have also been interested in this sphere for several decades (e.g. BENNET, 1980; HEALD, 1994; BLAŽEK, 1995). While economists often build models of public sector spending and frequently deal with the issue of the efficiency of public sector spending, geographers tend to derive the implications of public finance for regional development (e.g. BLAŽEK, 1995; PORTEOUS, 1995; MARTIN, 2005).

Obviously, fiscal policy as a whole has a huge regional impact, depending on the design of both the revenue and expenditure sides of the state budget. However, the regional patterns of both revenue and expenditure are unknown in most countries. Generally, it can be expected that a system of progressive taxation reduces revenues in more affluent regions while social benefits tend to flow into the less well off regions, representing an important mechanism for interregional redistribution (PRUDHOMME, 1993; WISHLADE *et al.*, 1996). The regional redistribution of financial resources via governmental policies is one of the important factors contributing to the economic growth of the respective regions (LEFEBER, 1964; GUISÁN and CANCELO, 1996) and helps the social stabilization and internal cohesion of the country in question (DE LA FLUENTE, 2004). Nevertheless, in the case of the regional allocation of capital expenditure, there is even less certainty about the actual regional pattern of this expenditure than in the case of current expenditure.

Authors focusing on analyses of the impact of governmental policy on the growth of particular regions arrive at the conclusion that public investments are having measurable positive effects on the respective regions (e.g. MARTHUR and STEIN, 1980; FŐLSTER and HENREKSON, 2001; AUTERI and COSTANTINI, 2004). Other studies are devoted to the investigation of efficiency issues (e.g. GUISÁN and CANCELO, 1996; DE LA FLUENTE, 2004). Other authors point to the problem of the insufficient coordination of different public policies

and activities, as their goals and effects can be overlapping or even contradictory (e.g. WISHLADE *et al.,* 1996; MARTIN, 2005; SHOUT and JORDAN, 2007). In addition, some other studies have dealt with issues of social justice or equity within the sphere of public finance (e.g. BOYN and POWELL, 1995).

One country where the allocation of public money attracts considerable attention from both politicians and analysts is the UK. However, the main rationale for these studies is mainly the issue of the distribution of public expenditure between England, Wales, Scotland and Northern Ireland in the context of devolution (e.g. SHORT, 1978; HEALD, 1994; HEALD and SHORT, 2002; MIDWINTER, 2004). In Japan, KATAOKA (2005) assessed the regional distribution of public investments between 47 prefectures in the post-war period. Kataoka noticed that periods of high national economic growth are positively correlated with the concentration of public investment into economically strong regions while in periods of low growth, a more balanced distribution of public capital expenditure has been observed. WILSON and WISE (1986) studied the regional implications of public investment in a developing country – Peru – over the period 1968–1983. They showed a high concentration of public investment into the rich coastal regions during three subsequent time periods, while a shift in favour of the poorer inland regions was observed in the second half of the period studied. However, according to these authors, this shift is mainly attributable to the huge investments in the mining industries in the inland regions.

3. Sectoral policies and regional policy

There have already been voices among experts suggesting that the regional impact of vigorously pursued sectoral policies is much more profound than the regional impact of regional policy itself (e.g. ROBERT *et al.*, 2001; MARTIN, 2005). Therefore, within this context, some authors distinguish regional policy in a "narrow" and "broad" sense, while

other authors prefer the terms "explicit" and "implicit" regional policy (e.g. ARMSTRONG and TAYLOR, 1985; CUADRADO, DE LA DEHESA and PRECEDO, 1993). While it can be agreed that regional policy in a "narrow" sense is synonym with explicit regional policy, the difference between implicit regional policy and a regional policy in a "broad" sense should be stressed. Implicit regional policy encompasses public policies which have been to a certain extent "regionalized" (i.e. there has been some sort of adjustments of an overall design of sectoral or non-regional policy in question to meet specific regional conditions and needs). Regional policy in a "broad" sense, on the other hand, comprises of all public policies or actions executed by the public sector which have important regional impacts and this importance is to some extent recognized (e.g. agricultural policy, transport policy, energy policy, competition policy, science and technology policy). Despite the fact that these policies often lack an explicit definition of regional goals, they are clearly having a specific impact on different regions (e.g. CUADRADO, DE LA DEHESA and PRECEDO, 1993; EUROPEAN COMMISSION, 1998, 2004; HILL and LOWE, 2007). Examples of public policies that reflect at least some specific regional characteristics or which react to specific regional conditions are the policy aimed at attracting large investors to the Czech Republic (UHLÍŘ, 2004) or the R&D policy in Germany (see KOSCHATZKY, 2001). Considerable attention has been paid to the regional impact of sectoral policies and analogous policies at EU level in studies undertaken within the ESPON programme (e.g. THE ESPON MONITORING COMMITTEE, 2005).

BLAŽEK (2005a) argues that one key component of fiscal policy that has an enormous regional impact is the way the decentralized public administration bodies (municipalities and regions) are financed. For example, in 2007, within the state budget of the Czech Republic only CZK 1.5 bln was allocated to explicit regional policy (which represents only 0,06 % of Czech GDP), while in the same year the state distributed more than CZK 160 bln to municipalities and regions via a strictly egalitarian tax-sharing formula (this volume amounts

7,7% of Czech GDP). It is clear that the principles upon which the applied model of financing local and regional government in particular countries rests are of tremendous importance and consequently, due to the vast amount of money concerned, the system of local government financing has a much more profound regional impact than official "explicit" regional policy.

Moreover, important regional impacts can be attributable even to non-spending policies, for example to an anti-monopoly policy. WISHLADE *et al.* (1996) consider the spatial impact of non-spending policies as "blind spots" of regional analyses.

4. The budgetary scheme of the Czech Republic

The budgetary scheme of the Czech Republic consists of two prime components – public budgets and extra-budgetary funds created for specific investment purposes such as transport infrastructure, and expenditure on environmental projects. (see Figure 1).

Figure 1: Simplified budgetary scheme of the Czech Republic

Source: modified on the basis of PEKOVÁ (2002), p. 79

(about here).

Nevertheless, due to the focus of this paper on the identification of spatial patterns in the allocation of public capital expenditure, the analysis was limited to a regional analysis (at the level of the NUTS 3 and NUTS 4 regions) of capital investment allocated from central sources, i.e. from the state budget and from state extra-budgetary funds. The Czech state budget operates with the dominant part of public finance assigned to public budgets, but as Table 1 illustrates, the share of state budget allocated to capital expenditure is rather small. This fact can be partly explained by the key role of state extra-budgetary funds in the case of such expenditure (see Table 2), as they are designed to function as a vehicle allowing the

implementation of multi-annual projects, while the state budget in principle provides the financial framework for one year only. In addition, a noteworthy volume of public capital expenditure flows through decentralized public budgets, and especially via municipal budgets (on average in 2000–2005 the capital expenditure of decentralized public budgets accounted for CZK 74.2 bln per year, which represents 28.5 % of the total decentralized public budgets on average per year). Nonetheless, in line with our research focus the analysis presented below concentrates only on the capital expenditure allocated from the central level.

Table 1: Expenditure of the Czech state budget in 1995–2005 (current prices, in billion CZK, in %)

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Note: In December 2007, the exchange rate was approx. 1 EUR = 27 CZK.

(about here)

Table 2: Expenditure from selected state extra-budgetary funds in 2000–2005 (current prices, in billion CZK)

Source: Statistical Yearbook of the Czech Republic 2000–2006.

(about here)

5. Data and Methodology

The prime source for this regional analysis of the capital expenditure of the state budget of the Czech Republic is the ISPROFIN (Information System of Programming Funding from the State Budget) database, which comprises data regarding investment spending from the state budget, in our case for the years 1995–2005. ISPROFIN is managed by the Ministry of

Finance of the Czech Republic and has been operational since 1995.[2] The structure of the entries into ISPROFIN allows a regional break-down of capital expenditure at the level of the NUTS 3 and 4 regions. However, several methodological problems arose during the analysis of this data, and consequently a number of projects and programmes (and the corresponding financial volume of capital expenditure) had to be excluded from the analysis. The following criteria for omitting particular projects or programmes were applied: i) the regional allocation of the investment incentives was not given or investment was implemented abroad; ii) the project or programme was predominately for current expenditure; iii) the project was of an "extraordinary" nature (i.e. expenditure devoted to the recovery of the territories affected by the 1997 and 2002 floods or devoted to the restitution to former owners of private property that was nationalized during the communist period).

[2] Except for the programmes set by a special act such as state support to the national cultural heritage or agriculture.

An overview of the financial amounts included (and excluded) from the regional analysis of public capital expenditure is given in Table 3. Another methodological challenge was represented by projects which benefited the whole country, but in ISPROFIN were assigned to one region only. This was especially the case for the purchase of jet fighter aircraft which were also excluded from the analysis.

This problem relates to the fundamental methodological question of which principle investment expenditure should be attributed to a certain region. For instance, SHORT (1978) has explicitly distinguished two types of regional expenditure: "regionally relevant" and "total expenditure" allocated to the region. According to Short, "regionally relevant" expenditure benefits only the region in which the particular public money was allocated. Alternatively, WISHLADE *et al.*, (1996) and also CAMINAL (2004) differentiated between the "flow" and "benefit" approaches to the analysis of the regional distribution of public expenditure. The "flow" approach assigns expenditure to regions regardless of whether or not the region in question is an "end user", while the "benefit" approach concentrates on the final beneficiaries of the public money spent, or more precisely on the final beneficiary regions. Consequently, in our analysis, the flow approach has been applied as it would be impossible to judge each of the approximately 40,000 investment projects of ISPROFIN included in the analysis on the basis of the benefit approach.

Table 3: Financial resources of ISPROFIN 1995–2005 (in billion CZK, current prices, in %)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), authors` calculations.

(about here)

In addition to ISPROFIN, which covers capital expenditure financed from the state budget, the two most relevant extra-budgetary funds were incorporated into our analysis. These two funds are: The State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF). The data on the individual projects supported by these funds were obtained from the responsible institutions. In the case of the State Fund for Transport Infrastructure, the capital expenditure for 2001–2005 has been analysed at the level of NUTS 3 regions. Investment projects to a total value of CZK 222.3 billion were included in the analysis. The State Environmental Fund is represented by the data concerning expenditure during the years 1999–2005, which amounted to CZK 13 billion. Therefore, this analysis covers capital expenditure from the state budget and from two extra-budgetary funds to a total value of CZK 617 bln. The analysis was structured into six parts, covering the most relevant thematic spheres of public capital expenditure (see Table 4).

Table 4: Overview of the analyzed data for the period 1995-2005 (in billion CZK, current prices)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), Internal materials of the State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF), authors` calculations.

(about here)

6. Results

In this section, the main results of the regional analysis of capital expenditure committed within the sectoral governmental policies in the Czech Republic will be presented (Table 4 provides an overview of the financial volumes analysed). First, attention is paid to an analysis of the distribution of all capital expenditure, that is an analysis of investment projects financed

from the state budget and from relevant state extra-budgetary funds. In view of the fact that the overall nature of regional differentiation of investment allocation is considerably influenced by investments in the transport infrastructure, in the next stage such investments are excluded from the analysis and analysed separately. Next, the regional allocation of investments in other relevant sectors is considered, namely the territorial allocation of investments within explicit regional policy, investments in universities and the R&D sector, and finally investment assigned to the environmental sector.

6.1. Regional analysis of total capital expenditure

The regional analysis of total capital expenditure financed from the central level (i.e. from the state budget and from both state extra-budgetary funds) in the period 1995–2005, includes nearly CZK 617 billion after the data has been 'cleaned' by the above described procedure. The nature of the capital expenditure determined that such invested funds were used primarily for development activities, and allocation of such investments has an undoubted dynamic effect on the relevant regions (e.g. SHORT, 1981; AUTERI and COSTANTINI, 2004).

The overall spatial pattern of the regional distribution of the analysed funds can be considered as significantly unbalanced. In the period studied, over one quarter of the analysed investments (which in absolute terms represents approximately CZK 168 billion) were allocated from the national level into the capital city of Prague, socio-economically the most advanced region of the Czech Republic (for regional GDP per capita see Figure 2). The dominance of Prague is also proved by relative indicators, i.e. investments per inhabitant (approximately CZK 142 thousand per inhabitant, which is 237% of the average for the Czech Republic - see Table 5). With respect to economic performance indicators, i.e. after putting capital expenditure in relation to the regional GDP level, it was 116% of the average

allocation of the Czech Republic and in relation to the economic aggregate it was 123% of the national average. The term economic aggregate was defined by HAMPL (2005) as the product of the number of jobs (the number of jobs is determined as the number of economically active persons after deducting the unemployed and adding the commuting balance calculated on the basis of the 2001 Census) and the average wage in the region in question. The Plzeňský and Olomoucký regions achieved an even higher investment allocation than Prague with respect to GDP (136%, resp. 137% - see Table 5), and the same order applies when the allocated investment volume is related to the economic aggregate.

Table 5: Capital expenditure per capita and per regional GDP (1995–2005, in %)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

6.2. Regional analysis of total capital expenditure after exclusion of transport investment

Since the extraordinary volume of investment devoted to transport infrastructure (CZK 222 billion from the state budget and from the State Fund for Transport Infrastructure – see Table 4) which undoubtedly influences the overall picture of the regional allocation of investment, such expenditure was excluded from the analysis in the following stage. The remaining investment projects thus represent approximately CZK 395 billion for the period of 1995–2005 again.

After the exclusion of projects in the transport infrastructure sector, the position of Prague is even higher (see Table 5). In absolute terms, its share of public capital expenditure in the Czech Republic actually increased to 37.5%, while in per capita terms the investment

allocation to Prague was 326% of the average value for the Czech Republic. No other NUTS 3 region received an above-average allocation per inhabitant. Even when the allocated investment projects are related to the regional GDP, the Prague region is still above the national average (see Table 5). Investments in Prague were directed particularly to the state administration (approximately CZK 55 billion), state defence (CZK 24 billion), health service (CZK 18.1 billion), infrastructure development (CZK 18.9 billion) as well as public city transport (4.8 billion CZK), R&D (CZK 6.9 billion) and education (CZK 8.7 billion).

As all data except for that on transport infrastructure projects was territorially identified up to NUTS 4 level, a detailed analysis of the regional distribution of capital expenditure, after exclusion of transport expenditure, could be carried out on the NUTS 4 level regions. At this hierarchical level, Prague dominates absolutely. The district of Kutná Hora achieved the second highest allocation per inhabitant and the highest allocation per economic aggregate, but this was thanks to extraordinary investments in the military air force base in Čáslav. The district of Brno–město (after Prague the second most important economic centre of the Czech Republic) is in third position with 162% of the average allocation per inhabitant. Brno also achieved the second highest share of 6%. The districts of Ostrava-město (2.2%), Olomouc (2.6%) and Plzeň-město (2.2%) also received significant shares. Other districts received only minor allocations.

Where capital expenditure was considered per inhabitant, above-average investments compared to the average for the Czech Republic were allocated to only 11 out of 77 districts, and 22 districts did not even achieve 50%. The regions receiving significantly below-average investment funds per inhabitant include the majority of districts in North-Western Bohemia and Northern Moravia (which, however, are mostly among the regions supported within

Czech regional policy – see Figure 2), the internal periphery, as well as a large area of Southern, Western, Northern and Eastern Bohemia and the Czech-Slovak borderland (see Figure 3).

Figure 2: Assisted regions supported within Czech explicit regional policy

Source: Ministry for Regional Development.

(about here)

Figure 3: Capital expenditure per capita after exclusion of transport infrastructure in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

Due to the unavailability of GDP data for NUTS 4 regions and the limited reliability of this indicator on the NUTS 3 regions, GDP was replaced by an economic aggregate. At regional level, this indicator achieves a very high correlation with regional GDP (0.998). After putting the allocated investment funds in relation to the economic aggregate (see Figure 4), Prague achieved 169% of the average for the Czech Republic (the highest allocations went to the districts of Kutná Hora - 257% and Prostějov - 170%, in both cases thanks to extraordinary investments in the defence sector). Highly uneven distribution of this expenditure illustrates well the fact that above-average values were achieved by only 13 districts, among which was also the second largest city (district Brno-město - 119 %).

Figure 4: Capital expenditure per economic aggregate after exclusion of transport infrastructure investments in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

(about here)

6.3. Capital expenditure in the transport sector

The extraordinary importance of investment devoted to the transport infrastructure is given by their very high volume (CZK 222 billion), which represents approximately 36% of the volume of the investment observed in this study. In addition, it is obvious that the regional formula of transport constructions, often linear in nature, may significantly differ from the spatial formula of other investment projects. For this reason, the transport sector was chosen for a separate regional analysis (i.e. investment in construction of motorways, expressways, railway corridors, and the underground in Prague). Despite a number of methodological constraints, it was possible to unite the two most important sources of funds for this sector: the state budget (i.e. ISPROFIN) and the State Fund for Transport Infrastructure. The total analysed investment volume of 1995–2005 exceeds CZK 222.3 billion (ISPROFIN – CZK 96.7 billion, the State Fund for Transport Infrastructure – CZK 125.5 billion), and the data are available only for NUTS 3 regions.

Figure 5 illustrates the considerably above-average allocation of investment in transport in Western Bohemia, which corresponds to the hypothesis of allocation of investment along a traditional west-east gradient in the level of socio-economic development. In transport investment, this gradient is raised by the effort to ensure transport connections for the Czech Republic or its capital of Prague with nearby economic centres in Germany (Munich, Frankfurt, Berlin). Although the area of Northern Moravia is a structurally affected region, as is North-Western Bohemia, transport investment has flowed more to Northern Bohemia in

recent years, because the transport connection with Poland was of less priority than connections to Germany or Western Europe.

Figure 5: Transport infrastructure investment per capita in NUTS 3 regions, 1995–2005, Czech Rep. = 100 % (in %)

Source: ISPROFIN, SFTI, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

The spatial formula for the allocation of per capita investment in transport is very similar to the case where transport investment is related to GDP (the correlation coefficient is 0.954). In both indicators the position of Prague is well below national average (78%, resp. 38% of the Czech Republic average). On the contrary, Plzeňský, Olomoucký, Ústecký and Karlovarský regions achieved significantly above-average allocations. However, in evaluating the regional distribution of transport infrastructure investments (and of general investments as well) it is necessary to consider the time aspect in the sense that if a significantly higher amount of funds is granted to a region in a certain time range, it may mean that the necessary infrastructure had not previously been constructed in the region in question and it is being built behind schedule or out of needs arising from the different geopolitical orientation of the Czech Republic after the fall of the Iron Curtain. For example, as early as the communist era, the D1 motorway was completed between Prague and Brno, leading across the Vysočina region, so this region records a significantly below-average allocation, while in the districts of Tachov and Plzeň-jih districts, the D5 connecting Prague and Bavaria was built during the period considered here.

The regional distribution of capital expenditure after the exclusion of transport infrastructure investments when related to the economic level of the region (GDP) shows that transport investments are what "aid" economically weaker regions to reach above-average values. If transport investments are not considered, Prague is quite clearly the region that gains most from redistribution of public investment both in per capita terms and in relation to GDP (116 %, or 159 % of the Czech Republic average - see Table 5).

6.4. Capital expenditure allocated within explicit regional policy

Since one of the aims of this article is to show a significant discrepancy between the regional formula for the allocation of public investment funds within non-regional policies and regional policy, this is presented by Figure 6 which shows investments granted to explicit regional policy from the state budget. Strikingly, the funds allocated within regional policy are spread widely across the whole territory of the Czech Republic. This is in sharp contrast with the very conception of regional policy as a policy which supports only selected regions. This finding cannot be justified by changes of assisted areas over the investigated period as there was considerable stability of both the regional pattern of lagging and leading regions and consequently also of assisted areas delineated for the sake of regional policy (BLAŽEK, 2005b). On the other hand, the pattern of investment within regional policy does confirm that a certain priority was given to the assisted areas. Namely, the Moravian districts, especially the southern and, to some extent, northern ones ranked among the largest recipients of such investments (together with North-Western Bohemia they rank among the regions supported within Czech explicit regional policy, as does Northern Bohemia to some degree). Nevertheless, it is necessary to mention a paradox as a statistically highly significant positive relation of regional policy investment to regional GDP and to the economic aggregate was demonstrated for NUTS 3 regions (in both cases excluding Prague - see Table 6a). The same

applies also to the level of NUTS 4 regions (see Table 6b) where a statistically significant positive relation was found between the regional policy capital expenditure and the level of economic development measured by the economic aggregate as a proxy for regional GDP. At the same time, a larger part of Moravia ranks, with other regions supported within explicit regional policy, as an area significantly underfinanced with respect to the total investment from the state budget after the exclusion of transport. In simple terms, districts supported within the explicit regional policy in the Czech Republic received only a very limited volume of investment from the national level (after the exclusion of transport constructions) (compare Figures 2, 3 and 4). On the other hand, support within Czech regional policy was significantly concentrated into these regions (see Figure 6). However, a huge difference in the financial sums invested has to be stressed again: CZK 7.2 billion for regional policy versus the total volume of the analysed funds amounting to CZK 617 billion. Nevertheless, although the volume of investments for regional policy at the national level is nearly negligible, its importance is significantly higher for the supported regions.

Figure 6: Capital expenditure per capita from the state budget devoted to explicit regional policy in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).
Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.
(about here)

Table 6a: Correlation of selected indicators for NUTS 3 regions (n=13 – Prague excluded)
Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

Table 6b: Correlation of selected indicators for NUTS 4 regions (n=76 – Prague excluded)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

(about here)

6.5. Capital expenditure for higher education, R&D and the environmental sector

Within the regional analysis of capital expenditure from the state budget of the Czech Republic, sectoral analyses were also carried out. As an example, Figure 7 shows investment from the state budget in the infrastructure of universities and colleges and other R&D institutions amounting to approximately CZK 25 billion. The expected regional distribution of such expenditure into economically more developed regions (Prague, Brno) and to regions where a public college is located, or to regions with headquarters of important research institutes (the Prague hinterland) was demonstrated (similar regional pattern of public R&D expenditure was shown by WISHLADE *et al.* 1996 or THE ESPON MONITORING COMMITEE 2005). Nevertheless, it is necessary to point out that it is not only capital expenditure from the central level that is devoted to this sector. For example, it was not possible to obtain data on the regional allocation of financial support for R&D projects allocated by the Grant Agency of the Czech Republic. In addition, it is necessary to take into account a frequent methodological problem, when some analysed data are allocated according to the headquarters of the institution in question, although such funds may then be invested in branches of the institution in a different region. It is thus probable that in fact investment in higher education and R&D is less concentrated than the data analysed shows.

Figure 7: Capital expenditure per capita of the state budget devoted to universities and for R&D institutions in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %)

Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

Figure 8 shows investment in the environment sector amounting to CZK 25.6 billion allocated both from the state budget and the State Environmental Fund. Although no clear relation between the distribution of funds and environmental quality has been shown, we may confirm to some extent that investment was allocated to regions in which it is necessary to solve a specific problem with respect to the environment (e.g. support of mining reduction, revitalising the river system, pond reconstructions).

A surprisingly high allocation of investment to border districts in South-Western Bohemia relates to investment in the territorially largest national park in the Czech Republic (The Šumava National Park). Figure 8 provides, however, a surprising finding, that investment projects in the environment sector are not greatly concentrated in the structurally handicapped regions in Northern Bohemia and in Northern Moravia where the environment is seriously damaged. There is one exception with high investment - the Česká Lípa district - where the running down of the uranium industry and subsequent cultivation of the area are jointly in progress.

Figure 8: Environmentally related capital expenditure per capita of the state budget in 1995–2005 and of the State Environmental Fund in 1999–2005 in NUTS 4 regions, Czech Rep. =100 % (in %)

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

6.6. Relation of capital expenditures to selected socio-economic variables

On the basis of correlation coefficients for selected indicators for NUTS 3 regions (Table 6a) we can demonstrate a statistically significant relation between all regional allocations of investment via all analysed categories of investment (i.e. total investment, total investment after exclusion of transport investment, transport investment, investment into R&D and universities and regional policy investment, and their economic performance expressed by the GDP and the economic aggregate. The same finding counts for correlation coefficients for NUTS 4 regions (Table 6b), however, due to data limitations only the correlation between 3 investment categories and the economic aggregate could be calculated. It is important to stress again that with respect to the declared objectives of Czech regional policy, the correlation between the share of investment allocated within explicit regional policy and economic performance should be negative. However, on both NUTS 3 and NUTS 4 level regions positive and even statistically significant values were obtained indicating that even allocation of investment within regional policy is not in line with its own strategic objective.

The identification and detailed assessment of factors behind these observed patterns goes beyond the focus of this paper, however at least a brief discussion should be included. In countries like the Czech Republic which are lacking instruments for the systematic evaluation of the effectiveness and efficiency of planned public investment, a relatively important role can be assumed for subjective factors. The decision making process on public investment committed from the central level basically proceeds at two levels. Firstly, on the basis of a proposal of the Ministry of Finance, the Government and Parliament decide about financial allocations to particular sectors that come under the responsibility of particular ministries. Secondly, there is a process of selection of priorities by a particular ministry. In this case, three main factors influencing the decision making process on public investments might be identified: i) the adopted strategy for a specific sector (inevitably even these strategic documents can to some extent reflect subjective factors), ii) the interests of (esp. high-

ranking) public servants and iii) the interests of politicians. On the basis of our experience of more than 10 years of contractual cooperation by one of the authors with one central administration body we can draw two preliminary conclusions. First, the relevance of these three types of factors differs widely among different sectoral policies. Second, in some cases each of the three above mentioned factors can be decisive. This, therefore, makes a clear case for the introduction of some instruments (including TIA) that would be able to "objectivise" the need for public investment.

7. Conclusions and policy implications

The article aims to contribute to the debate on the regional dimension of sectoral (non-regional) governmental policies and to empirically demonstrate the huge discrepancy between both the volume and regional pattern of public capital expenditure committed within the national sectoral policies on the one hand and the official regional policy on the other. The performed analyses focused "only" on the public capital expenditures allocated by the Government of the Czech Republic, but it can be claimed that public capital investments have the most important implications for the development of particular regions (SHORT, 1981; YAMANO and OHKAWARA, 2000). Obviously, the financial volume of the total public capital expenditure is incomparably higher than the financial volume allocated to explicit regional policy.

The regional analyses performed were based on the dataset of public capital expenditure in the Czech Republic covering the years 1995–2005 and demonstrated uneven regional distribution of these investments in favour of the most economically developed region of the Czech Republic – the capital city of Prague. Such a regional pattern for the distribution of public investment supports the hypothesis that there exists a contradiction between the regional impact of sectoral policies on the one hand, and the goals of explicit regional policy

on the other. The discrepancy between these two is particularly striking as assisted regions delineated for the sake of national regional policy were to a large extent left aside by decisions regarding the allocation of public capital expenditure (with the exception of expenditure on transport infrastructure). Moreover, a surprising pattern was identified even in the case of investment committed within explicit regional policy (see Fig. 6) which is not coinciding well with the map of assisted areas (see Fig. 2). Clearly, the allocation of regional policy investments is not respecting fully the objectives of regional policy itself.

Consequently, there is a clear conflict between the goals of explicit regional policy aiming at the support of less well-off regions and mostly unintended regional impacts of much more vigorous non-regional governmental policies generally supporting the most developed regions. These findings are in line with research performed by e.g. WILSON and WISE (1986) but in contrast with results of YAMANO and OHKAWARA (2000).

However, it is necessary to stress that from the point of view of the entire expenditure side of the governmental policies comprising both capital and current expenditure, the region of Prague is very likely the most important net payer into the system of public finance due to its buoyant tax base and to its relatively low share of persons receiving social benefits (see OUŘEDNÍČEK and NOVÁK, 2006). Nevertheless, it is clear that the uneven distribution of public capital expenditure, generally favouring more developed regions, is one of the most important mechanisms of regional differentiation and is, moreover, cumulative in nature.

The expectation of a replication of the traditional East-West gradient in the level of socio-economic development by the regional structure of total capital expenditure has not been experienced. However, the evidence supporting this expectation can be observed in the case of the capital expenditure allocated to transport infrastructure. The greater support of transport

infrastructure projects in the Western part of the Czech Republic is a reflection of the priority assigned to connecting the Czech Republic to Western European structures.

Key implications deriving from the conducted regional analysis relate in particular to the necessity of developing a sound methodology for the territorial impact assessment of public policies and programmes. In other words, it is essential to develop a procedure evaluating not only the regional impact of incentives carried out within explicit regional policy (which is already becoming common practice in the most developed countries) but also the impact of public interventions which do not explicitly incorporate a regional dimension but where implementation might have a significant regional impact. Such an evaluative instrument is essential for tackling of regional development issues and problems more effectively by achieving synergies and eliminating contradictions between different policies (SCHÄFFER, 2005; CEC, 2006a, 2006b). Nevertheless, this approach is a real challenge due to the fact that public policies in most advanced countries are traditionally being implemented via sectorally structured public administration at central governmental level while the relevance of sectoral policies for development of particular regions has been clearly underestimated (ROBERT *et al.*, 2001; MACEŠKOVÁ, 2007).

Despite the effort that has been put into developing TIA methodology, no comprehensive and satisfactory tool for regional impact assessment has yet been developed. Therefore, as also documented by our empirical results, which showed both an uneven spatial pattern of the allocation of public capital expenditure and a huge mismatch between the regional pattern of this expenditure and the assisted regions, the development of a suitable instrument for territorial/regional impact assessment and its application at least to the most relevant sectoral policies remains a critical challenge for both researchers and decision-makers.

Acknowledgements

This paper received financial support from Research Programme No. MSM 0021620831 and from project 2D06012 "Socio-Spatial Differentiation of Population and its Impact on Quality of Life in Cities and Communities in the Czech Republic" both sponsored by the Czech Ministry of Education, Youth and Sport. The authors would also like to thank to two anonymous referees for their helpful comments.

Table 1: Expenditure of the Czech state budget in 1995-2005 (current prices, in billion CZK, in %)

	1995	1996	1997	1998	1999
Total expenditure of the state budget	432.7	484.4	524.7	566.7	596.9
of which capital expenditures of the state budget	44.1	46.4	50.6	50.5	59.0
share of capital expenditures of the total expenditure of the state budget (%)	10,2	9,6	9,6	8,9	9,9

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Note: In December 2007, the exchange rate was approx. 1 EUR = 27 CZK.

Table 1 continued

	2000	2001	2002	2003	2004	2005
Total expenditure of the state budget	632.3	693.9	750.8	808.7	862.9	923.0
of which capital expenditures of the state budget	60.9	49.6	49.7	56.9	66.7	79.0
share of capital expenditures of the total expenditure of the state budget (%)	9,6	7,1	6,6	7,4	7,7	8,3

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Table 2: Expenditure from selected state extra-budgetary funds in 2000-2005 (current prices, in billion CZK)

	2000	2001	2002	2003	2004	2005
Total expenditure of the State Environmental Fund of the Czech Republic	2.9	3.8	4.2	4.8	4.2	3.4
of which capital expenditure of the State Environmental Fund of the Czech Republic	2.6	3.5	3.7	4.2	3.7	3.0
share of capital expenditure of the entire expenditure of the State Environmental Fund of the Czech Republic	89.7	92.1	88.1	87.5	88.1	88.2
Total expenditure of the State Fund for Transport Infrastructure	8.5	30.6	40.2	41.3	52.1	48.5
of which the capital expenditure of the State Fund for Transport Infrastructure	5.0	13.9	24.1	25.1	34.6	37.8
share of capital expenditure of the entire expenditure of the State Fund for Transport Infrastructure	58.8	45.4	60.0	60.8	66.4	77.9

Source: Statistical Yearbook of the Czech Republic 2000 - 2006.

Table 3: Financial resources of ISPROFIN 1995-2005 (in billion CZK, current prices, in %)

ISPROFIN	billion CZK	share of the total sum of ISPROFIN (in %)
Total	658.9	100.0
Included into analysis	478.5	72.6
Totally excluded from the analysis	180.3	27.4
of which regional allocation unknown	81.7	12.5
allocation abroad	6.1	0.9
current expenditures	37.7	5.7
extraordinary expenditures	14.7	2.3
other specific capital expenditures - e.g. purchase of fighter aircraft	39.5	6.0

Source: ISPROFIN, authors` calculations.

Table 4: Overview of the analyzed data for the period 1995-2005 (in billion CZK, current prices)

Thematic sphere of capital expenditure	Financial volume	Source	Level
Total capital expenditure	617.2	State budget (ISPROFIN), SFTI, SEF	NUTS 3
Capital expenditure excluding transport infrastructure investments	394.9	State budget (ISPROFIN), SEF	NUTS 3 NUTS 4
Transport infrastructure investments	222.3	SFTI, State budget (ISPROFIN)	NUTS 3
Explicit regional policy and regional development	7.2	State budget (ISPROFIN)	NUTS 4
Environmental capital expenditure	25.6	SEF, State budget (ISPROFIN)	NUTS 4
Capital expenditure devoted to universities and R&D	25.4	State budget (ISPROFIN)	NUTS 4

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), Internal materials of the State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF), authors` calculation.

Table 5: Capital expenditure per capita and related to regional GDP (1995-2005, in %)

Region	Total investments in bln CZK	Total investments per capita Czech Rep. = 100 %	Total investments excluded of transport infrastructure investments per capita, Czech Rep. = 100 %	GDP per capita, Czech Rep. = 100 %	Total investments per GDP, Czech Rep. = 100 %	Total investments excluded of transport infrastructure investments per GDP, Czech Rep. = 100 %	Transport infrastructure investments per GDP, Czech Rep. = 100 %
Prague	168.3	237	326	206	116	159	38
Central Bohemia region	55.9	84	76	95	86	78	100
South Bohemia region	29.2	78	66	89	87	74	109
Plzeňský region	42.3	128	89	94	136	95	209
Karlovarský region	13.1	71	44	80	89	55	150
Ústecký region	45.3	91	53	82	111	64	194
Liberecký region	21.9	85	85	83	102	103	102
Královehradecký region	22.6	68	78	90	76	86	57
Pardubický region	23.6	77	66	84	92	78	116
Vysočina region	18.8	60	67	87	69	78	54
South Moravia region	61.6	90	93	93	98	101	93
Olomoucký region	40.9	106	87	77	137	113	181
Zlínský region	19.9	55	57	82	68	71	64
Moravskoslezský region	53.9	70	51	80	89	65	131
Czech Republic	617.2	100	100	100	100	100	100

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Table 6a: Correlation of selected indicators for NUTS 3 regions (n=13 - Prague excluded)

	Regional share of GDP	Regional share of economic aggregate	Regional unemployment rate	Regional share of total investment	Regional share of transport investment	Regional share of investment excluding transport	Regional share of investment in universities and R&D
Regional share of economic aggregate	0,993						
Regional unemployment rate	0,304	0,357					
Regional share of total investment	0,906	0,910	0,399				
Regional share of transport investment	0,717	0,741	0,634	0,892			
Regional share of investment excluding transport	0,905	0,890	0,097	0,903	0,612		
Regional share of investment in universities and R&D	0,583	0,592	-0,001	0,618	0,323	0,775	
Regional share of expenditure on regional policy	0,782	0,818	0,547	0,710	0,573	0,698	0,617

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

Note: Critical value of correlation coefficient for 95% level of significance is 0,497.

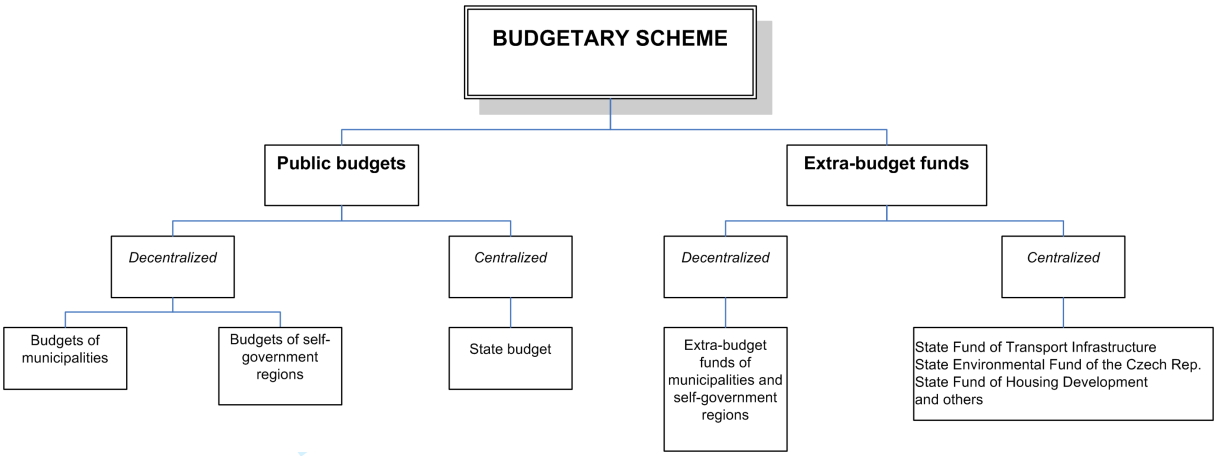
Table 6b: Correlation of selected indicators for NUTS 4 regions (n=76 - Prague excluded)

	Regional share of economic aggregate	Regional unemployment rate	Regional share of investment excluding transport	Regional share of investment in universities and R&D
Regional unemployment rate	0,111			
Regional share of investment excluding transport	0,851	-0,009		
Regional share of investment in universities and R&D	0,822	-0,039	0,915	
Regional share of expenditure on regional policy	0,320	0,404	0,228	0,122

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

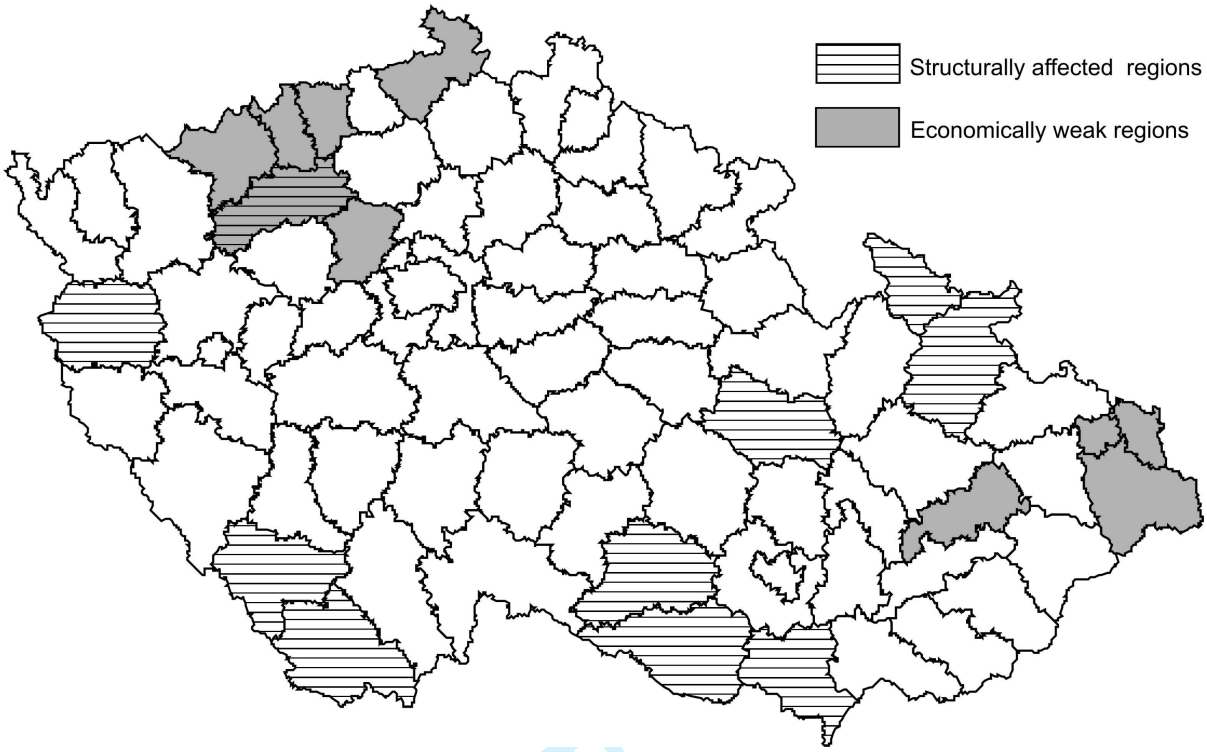
Note: Critical value of correlation coefficient for 95% level of significance is 0,200.

Figure 1: Simplified budgetary scheme of the Czech Republic



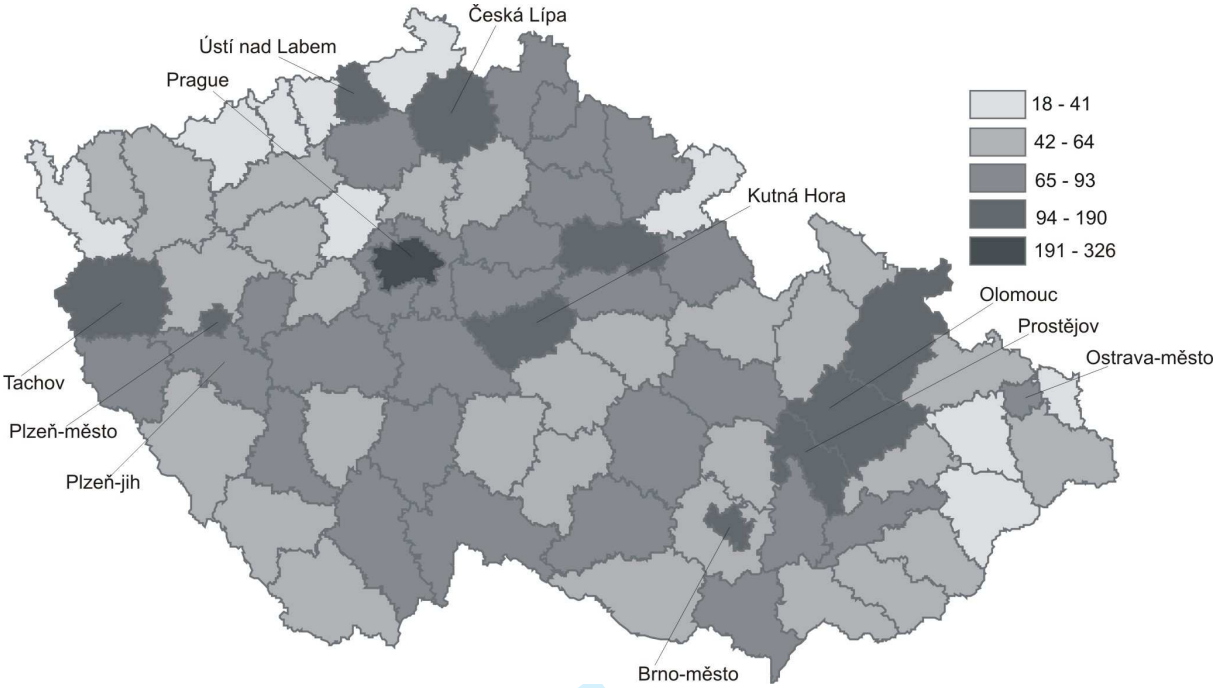
Source: modified on the basis of PEKOVÁ (2002), p. 79

Figure 2: Assisted regions supported within Czech explicit regional policy



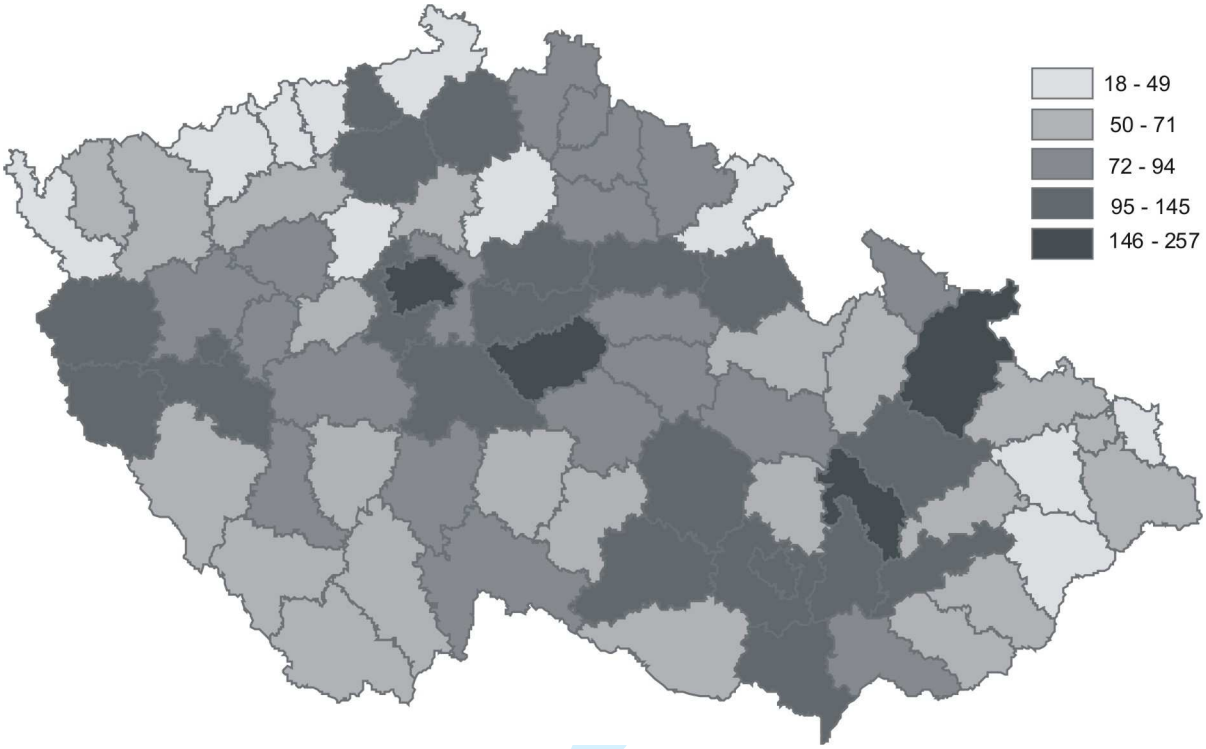
Source: Ministry for Regional Development.

Figure 3: Capital expenditure per capita after exclusion of transport infrastructure in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).



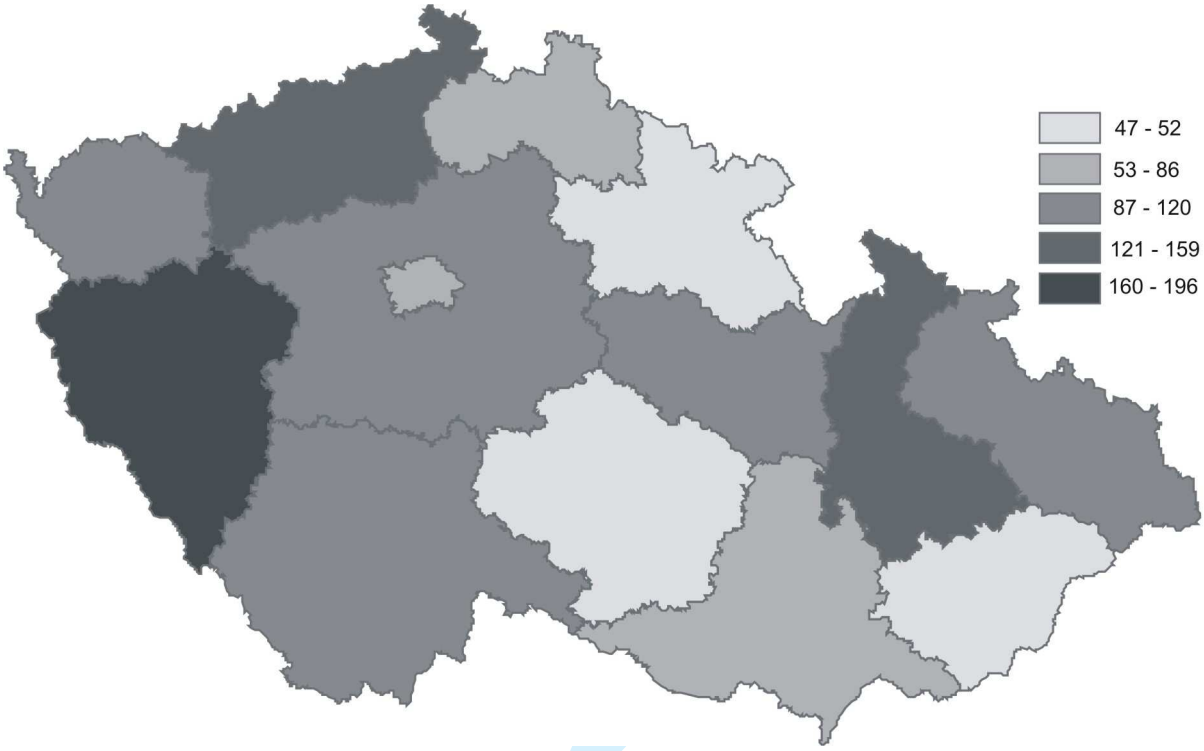
Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Figure 4: Capital expenditure per economic aggregate after exclusion of transport infrastructure investments in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).



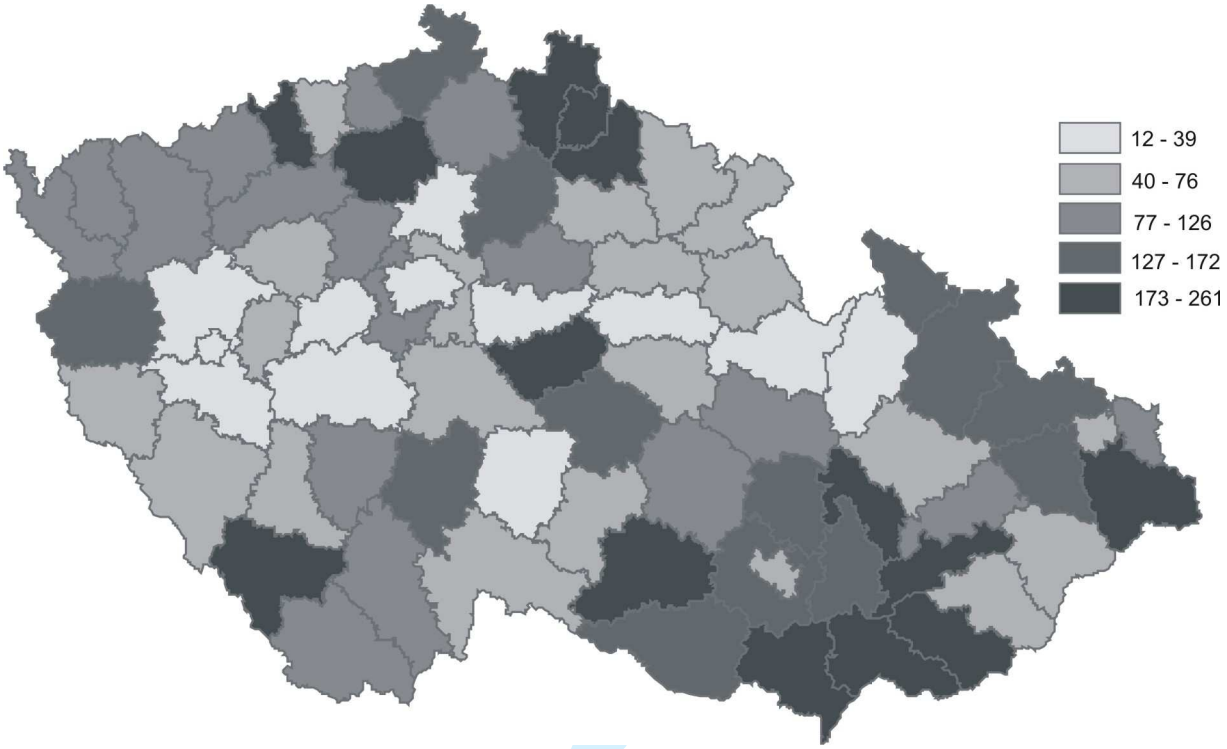
Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

Figure 5: Transport infrastructure investment per capita in NUTS 3 regions, 1995–2005, Czech Rep. = 100 % (in %)



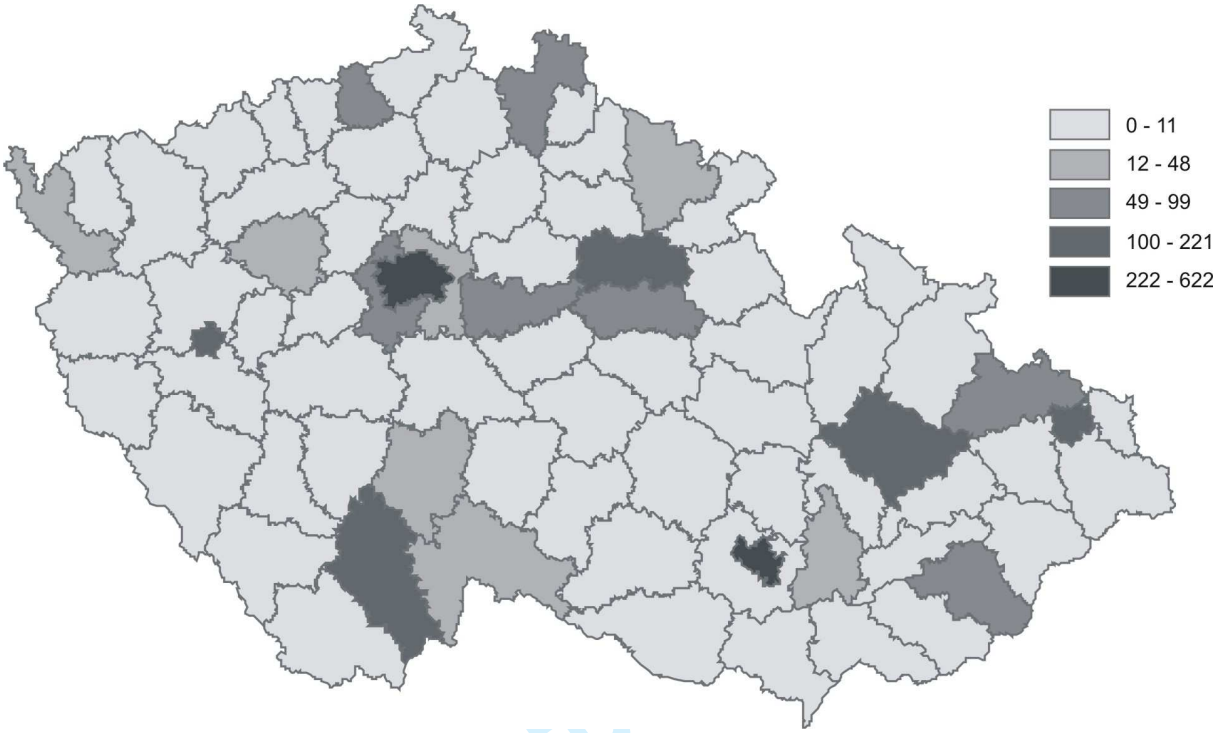
Source: ISPROFIN, SFTI, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Figure 6: Capital expenditure per capita from the state budget devoted to explicit regional policy in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).



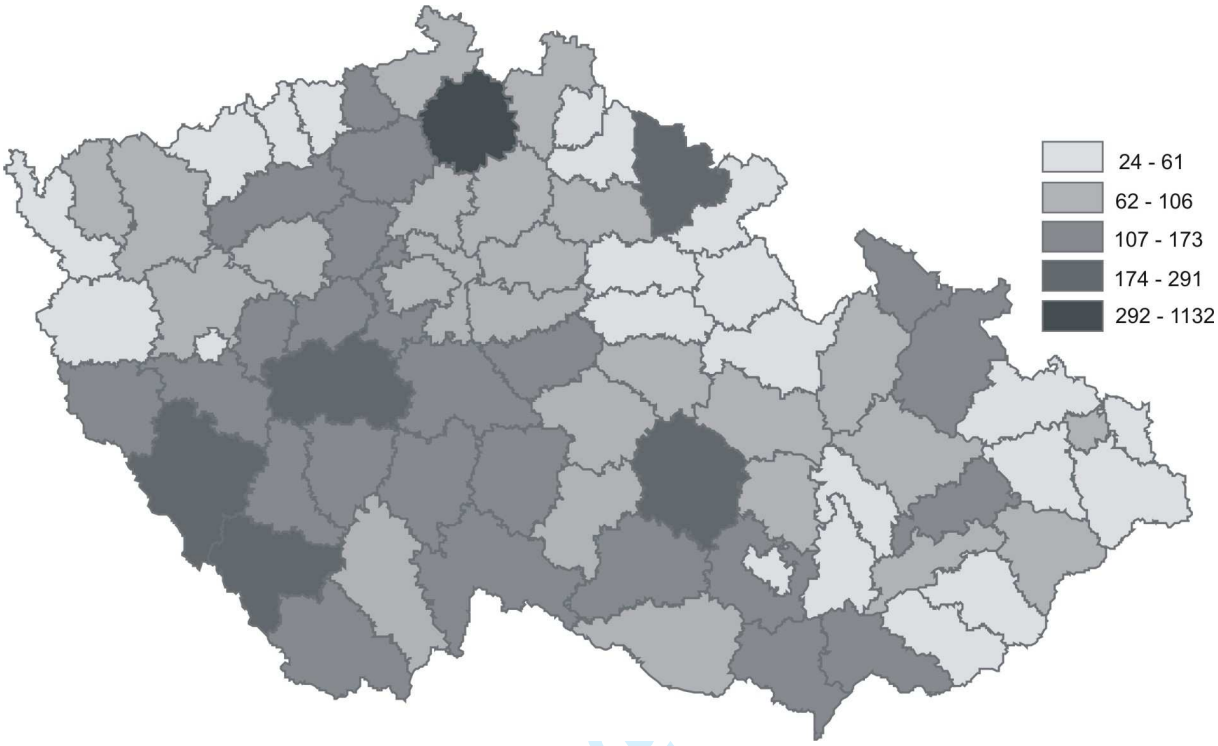
Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Figure 7: Capital expenditure per capita of the state budget devoted to universities and for R&D institutions in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %)



Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Figure 8: Environmentally related capital expenditure per capita of the state budget in 1995–2005 and of the State Environmental Fund in 1999–2005 in NUTS 4 regions, Czech Rep. =100 % (in %)



Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Regional analysis of public capital expenditure: to which regions is public capital expenditure channelled – to "rich" or to "poor" ones?

Abstract

The paper aims to contribute to the debate on the regional dimension of sectoral (i.e. non-regional) policies and to empirically demonstrate the huge discrepancy between both the volume and the regional pattern of sectoral public capital expenditure policies on the one hand, and official regional policy on the other. The analyses were based on a unique database of public investment in the Czech Republic covering the years 1995–2005. Their results show significant conflicts in policy objectives and thus represent a clear argument in favour of pursuing territorial impact assessment (TIA) of sectoral policies.

Key words: regional impact of non-regional policies, sectoral policies**,** territorial impact assessment, regional policy, public investments, Czech Republic

JEL classifications: H5, E61, R 11, R 58

Acknowledgements

This paper received financial support from Research Programme No. MSM 0021620831 sponsored by the Czech Ministry of Education, Youth and Sport. The authors would like to thank to two anonymous referees for their helpful comments.

1. Introduction

The aim of the paper is to contribute to the debate on the regional dimension and the regional impact of sectral public capital expenditure policies. This debate started decades ago (e.g. SHORT, 1978; BENNETT, 1980; MARTHUR and STEIN, 1980; MOLLE and CAPPELLIN,

1988) but recently received a significant impetus in the form of a discussion on the regional impact of sectoral policies and the possibilities of their "regionalization" (e.g. DG RESEARCH, 1991; MARTIN, 1999; ROBERT *et al*., 2001; MOLLE, 2007). The "regionalization" of sectoral policies can be understood as the fine-tuning of sectoral public expenditure according to the needs and circumstances of specific regions.[i] One of the important results of this discussion was the gradual development of the methodology of the territorial impact assessment of large projects and later, also of programmes and policies – SCHINDEGGER and TATZBERGER, 2003; CAMAGNI, 2006). The increasing attention being paid to the regional dimension of public expenditure policies stemmed originally from the effort to learn how to improve or - more precisely - how to ensure the coordination of the territorial impact of the EU policy of economic and social cohesion (ESC) and of other European policies (e.g. CEC, 1996; SHOUT and JORDAN, 2007). Moreover, at the same time, there was a significant research endeavour to discover to what extent the regional impact of ESC policy has been in compliance with the spatial effects of numerous national public policies of the EU Member States (CEC, 2004).

Nevertheless, the number of existing analyses of the regional impact of sectoral policies is still relatively limited (for exceptions see e.g. HEALD, 1994; AUTERI and COSTANTINI, 2004; KATAOKA, 2005; MACEŠKOVÁ, 2007), mostly due to the severe data limitations in most countries. Therefore, the main aim of this article is an attempt to perform an analysis of the regional dimension of public capital expenditure in one of the new Member States (the Czech Republic) at the level of the NUTS 3 and 4 regions. This analysis is based on a unique data set of capital public expenditure covering investment projects supported during 1995–2005.

The analyses undertaken here are aimed at answering several research questions. Firstly, the relation between the level of the socio-economic development of the regions and the amount of invested public capital expenditure will be investigated. It is assumed that

public investments are highly concentrated in the most socio-economically developed regions. Such a regional allocation of this type of public funds would be in accordance with the principles of a strategic regional policy (for more on strategic regional policy see e.g. GORZELAK, 1992). In other words, given the many deficiencies in the sphere of the technical and other infrastructures inherited from the communist period, it is supposed that public investment was primarily focused on the enhancement of the infrastructure in major cities and namely in Prague to strengthen the gateway effect (DRBOHLAV and SÝKORA, 1997) and to enhance the competitiveness of the national metropolis on the international scene.

Moreover, another reason for the anticipated concentration of public investment in core regions is the assumed the higher efficiency of investment in these regions (e.g. CAMINAL, 2004; DE LA FLUENTE, 2004). Therefore, a positive correlation between the level of socio-economic development and the amount of public capital invested (relative per capita) is expected. However, it should be stressed that such a regional pattern of public investment contradicts the objectives of the Czech national strategy for regional development and of regional policy aiming at decreasing regional disparities and being in compliance with the "insurance" type of regional policy (MRD, 2006; GORZELAK, 1992). As a result, it can be argued that there is an immense policy conflict between goals of explicit regional policy and mostly unintended spatial impacts of much more vigorous non-regional governmental policies. Therefore, our analyses might also serve as empirical support for the importance of pursuing territorial impact assessment (TIA), both for major public capital projects and for sectoral policies as a whole.

Secondly, a replication of the traditional East-West gradient of socio-economic development by the regional structure of capital expenditure is also expected (for more on the East-West gradient, see BLAŽEK and CSANK, 2007).

Obviously, given the fact that public capital expenditure is highly "visible", the allocation is inevitably subject to challenge in the political arena, and a significant role of subjective and "soft" factors in the regional allocation of this expenditure is envisaged. Despite the fact that the available data does not allow for a thorough explanation of the obtained result, the potentially most important explanatory factors are identified.

Finally, it is believed that a detailed scrutiny of the regional structure of public expenditure significantly helps our understanding of regional development.

The paper is structured as follows. Firstly, the theoretical debate and the most important findings of previous studies are summarized. Next, the data and the methodology are described. Thirdly, the main findings of the empirical analyses of public capital expenditure on the NUTS 3 and NUTS 4 levels are provided and discussed. Finally, conclusions and policy implications are drawn.

2. Regional impact of fiscal policy and its sectoral policies

The subject of public finance and fiscal policy is an important and traditional sphere of research for economists (e.g. MUSGRAVE and MUSGRAVE, 1973; ATKINSON and STIGLITZ, 1980), nevertheless, geographers have also been interested in this sphere for several decades (for example BENNET, 1980; HEALD, 1994; BLAŽEK, 1995). While economists often build models of public sector spending and frequently deal with the issue of the efficiency of public sector spending, geographers tend to derive the implications of public finance for regional development (for example BLAŽEK, 1995; PORTEOUS, 1995).

Obviously, fiscal policy as a whole has a huge regional impact, depending on the design of both the revenue and expenditure sides of the state budget. However, the regional patterns of both revenue and expenditure are unknown in most countries. Generally, it can be expected that a system of progressive taxation reduces revenues in more affluent regions

while social benefits tend to flow into the less well off regions, representing an important mechanism for interregional redistribution (PRUDHOMME, 1993; WISHLADE *et al.*, 1996). The regional redistribution of financial resources via fiscal policy is one of the important factors contributing to the economic growth of the respective regions (LEFEBER, 1964; GUISÁN and CANCELO, 1996) and helps the social stabilization and internal cohesion of the country in question (DE LA FLUENTE, 2004). Nevertheless, in the case of the regional allocation of capital expenditure, there is even less certainty about the actual regional pattern of this expenditure than in the case of current expenditure.

Authors focusing on analyses of the impact of fiscal policy on the growth of particular regions arrive at the conclusion that public investments are having measurable positive effects on the respective regions (e.g. MARTHUR and STEIN, 1980; FŐLSTER and HENREKSON, 2001; AUTERI and COSTANTINI, 2004). Other studies are devoted to the investigation of efficiency issues (for example GUISÁN and CANCELO, 1996; DE LA FLUENTE, 2004). Other authors point to the problem of the insufficient coordination of different public policies and activities, as their goals and effects can be overlapping or even contradictory (e.g. WISHLADE *et al.,* 1996; MARTIN, 2005; SHOUT and JORDAN, 2007). In addition, some other studies have dealt with issues of social justice or equity within the sphere of public finance (e.g. BOYN and POWELL, 1995).

One country where the allocation of public money attracts considerable attention from both politicians and analysts is the UK. However, the main rationale for these studies is mainly the issue of the distribution of public expenditure between England, Wales, Scotland and Northern Ireland in the context of devolution (e.g. SHORT, 1978; HEALD, 1994; HEALD and SHORT, 2002; MIDWINTER, 2004). In Japan, KATAOKA (2005) assessed the regional distribution of public investments between 47 prefectures in the post-war period. Kataoka noticed that periods of high national economic growth are positively correlated with the

concentration of public investment into economically strong regions while in periods of low growth, a more balanced distribution of public capital expenditure has been observed. WILSON and WISE (1986) studied the regional implications of public investment in a developing country – Peru – over the period 1968–1983. They showed a high concentration of public investment into the rich coastal regions during three subsequent time periods, while a shift in favour of the poorer inland regions was observed in the second half of the period studied. However, according to these authors, this shift is mainly attributable to the huge investments in the mining industries in the inland regions.

3. Sectoral policies and regional policy

There have already been voices among experts suggesting that the regional impact of vigorously pursued sectoral policies is much more profound than the regional impact of regional policy itself (e.g. ROBERT *et al.*, 2001; MARTIN, 2005). Therefore, within this context, some authors distinguish regional policy in a "narrow" and "broad" sense, while other authors prefer the terms "explicit" and "implicit" regional policy (e.g. ARMSTRONG and TAYLOR, 1985; CUADRADO, DE LA DEHESA and PRECEDO, 1993). While it can be agreed that regional policy in a "narrow" sense is synonym with explicit regional policy, the difference between implicit regional policy and a regional policy in a "broad" sense should be stressed. Implicit regional policy encompasses public policies which have been to a certain extent "regionalized" (i.e. there has been some sort of adjustments of an overall design of sectoral or non-regional policy in question to meet specific regional conditions and needs). Regional policy in a "broad" sense, on the other hand, comprises of all public policies or actions executed by the public sector which have important regional impacts and this importance is to some extent recognized (e.g. agricultural policy, transport policy, energy policy, competition policy, science and technology policy). Despite the fact that these policies often lack an

explicit definition of regional goals, they are clearly having a specific impact on different regions (e.g. CUADRADO, DE LA DEHESA and PRECEDO, 1993; EUROPEAN COMMISSION, 1998, 2004; HILL and LOWE, 2007). Examples of public policies that reflect at least some specific regional characteristics or which react to specific regional conditions are the policy aimed at attracting large investors to the Czech Republic (UHLÍŘ, 2004) or the R&D policy in Germany (see KOSCHATZKY, 2001). Considerable attention has been paid to the regional impact of sectoral policies and analogous policies at EU level in studies undertaken within the ESPON programme (e.g. THE ESPON MONITORING COMMITTEE 2005).

BLAŽEK (2005a) argues that one key component of fiscal policy that has an enormous regional impact is the way the decentralized public administration bodies (municipalities and regions) are financed. For example, in 2007, within the state budget of the Czech Republic only CZK 1.5 bln was allocated to explicit regional policy (which represents only 0,06 % of Czech GDP), while in the same year the state distributed more than CZK 160 bln to municipalities and regions via a strictly egalitarian tax-sharing formula (this volume amounts 7,7% of Czech GDP). It is clear that the principles upon which the applied model of financing local and regional government in particular countries rests are of tremendous importance and consequently, due to the vast amount of money concerned, the system of local government financing has a much more profound regional impact than official "explicit" regional policy.

Moreover, important regional impacts can be attributable even to non-spending policies, for example to an anti-monopoly policy. WISHLADE *et al.*, (1996) consider the spatial impact of non-spending policies as "blind spots" of regional analyses.

4. The budgetary scheme of the Czech Republic

The budgetary scheme of the Czech Republic consists of two prime components – public budgets and extra-budgetary funds created for specific investment purposes such as transport infrastructure, and expenditure on environmental projects. (see Figure 1).

Figure 1: Simplified budgetary scheme of the Czech Republic

Source: modified on the basis of PEKOVÁ (2002), p. 79

(about here).

Nevertheless, due to the focus of this paper on the identification of spatial patterns in the allocation of public capital expenditure, the analysis was limited to a regional analysis (at the level of the NUTS 3 and NUTS 4 regions) of capital investment allocated from central sources, i.e. from the state budget and from state extra-budgetary funds. The Czech state budget operates with the dominant part of public finance assigned to public budgets, but as Table 1 illustrates, the share of state budget allocated to capital expenditure is rather small. This fact can be partly explained by the key role of state extra-budgetary funds in the case of such expenditure (see Table 2), as they are designed to function as a vehicle allowing the implementation of multi-annual projects, while the state budget in principle provides the financial framework for one year only. In addition, a noteworthy volume of public capital expenditure flows through decentralized public budgets, and especially via municipal budgets (on average in 2000–2005 the capital expenditure of decentralized public budgets accounted for CZK 74.2 bln per year, which represents 28.5 % of the total decentralized public budgets on average per year). Nonetheless, in line with our research focus the analysis presented below concentrates only on the capital expenditure allocated from the central level.

Table 1: Expenditure of the Czech state budget in 1995–2005 (current prices, in billion CZK, in %)

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Note: In December 2007, the exchange rate was approx. 1 EUR = 27 CZK.

(about here)

Table 2: Expenditure from selected state extra-budgetary funds in 2000–2005 (current prices, in billion CZK)

Source: Statistical Yearbook of the Czech Republic 2000–2006.

(about here)

5. Data and Methodology

The prime source for this regional analysis of the capital expenditure of the state budget of the Czech Republic is the ISPROFIN (Information System of Programming Funding from the State Budget) database, which comprises data regarding investment spending from the state budget, in our case for the years 1995–2005. ISPROFIN is managed by the Ministry of Finance of the Czech Republic and has been operational since 1995.[ii] The structure of the entries into ISPROFIN allows a regional break-down of capital expenditure at the level of the NUTS 3 and 4 regions. However, several methodological problems arose during the analysis of this data, and consequently a number of projects and programmes (and the corresponding financial volume of capital expenditure) had to be excluded from the analysis. The following criteria for omitting particular projects or programmes were applied: i) the regional allocation of the investment incentives was not given or investment was implemented abroad; ii) the project or programme was predominately for current expenditure; iii) the project was of an "extraordinary" nature (i.e. expenditure devoted to the recovery of the territories affected by the 1997 and 2002 floods or devoted to the restitution to former owners of private property that was nationalized during the communist period).

An overview of the financial amounts included (and excluded) from the regional analysis of public capital expenditure is given in Table 3. Another methodological challenge was represented by projects which benefited the whole country, but in ISPROFIN were assigned to one region only. This was especially the case for the purchase of jet fighter aircraft which were also excluded from the analysis.

This problem relates to the fundamental methodological question of which principle investment expenditure should be attributed to a certain region. For instance, SHORT (1978) has explicitly distinguished two types of regional expenditure: "regionally relevant" and "total expenditure" allocated to the region. According to Short, "regionally relevant" expenditure benefits only the region in which the particular public money was allocated. Alternatively, WISHLADE *et al.*, (1996) and also CAMINAL (2004) differentiated between the "flow" and "benefit" approaches to the analysis of the regional distribution of public expenditure. The "flow" approach assigns expenditure to regions regardless of whether or not the region in question is an "end user", while the "benefit" approach concentrates on the end users of the public money spent, or more precisely on the final beneficiary regions. Consequently, in our analysis, the flow approach has been applied as it would be impossible to judge each of the approximately 40,000 investment projects of ISPROFIN included in the analysis on the basis of the benefit approach.

Table 3: Financial resources of ISPROFIN 1995–2005 (in billion CZK, current prices, in %)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), authors` calculations.

(about here)

In addition to ISPROFIN, which covers capital expenditure financed from the state budget, the two most relevant extra-budgetary funds were incorporated into our analysis. These two funds are: The State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF). The data on the individual projects supported by these funds were obtained from the responsible institutions. In the case of the State Fund for Transport Infrastructure, the capital expenditure for 2001–2005 has been analysed at the level of NUTS 3 regions. Investment projects to a total value of CZK 222.3 billion were included in the analysis. The State Environmental Fund is represented by the data concerning expenditure during the years 1999–2005, which amounted to CZK 13 billion. Therefore, this analysis covers capital expenditure from the state budget and from two extra-budgetary funds to a total value of CZK 617 bln. The analysis was structured into six parts, covering the most relevant thematic spheres of public capital expenditure (see Table 4).

Table 4: Overview of the analyzed data for the period 1995-2005 (in billion CZK, current prices)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), Internal materials of the State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF), authors` calculations.

(about here)

6. Results

In this section, the main results of the regional analysis of capital expenditure committed within the sectoral governmental policies in the Czech Republic will be presented (Table 4 provides an overview of the financial volumes analysed). First, attention is paid to an analysis of the distribution of all capital expenditure, that is an analysis of investment projects financed from the state budget and from relevant state extra-budgetary funds. In view of the fact that

the overall nature of regional differentiation of investment allocation is considerably influenced by investments in the transport infrastructure, in the next stage such investments are excluded from the analysis and analysed separately. Next, the regional allocation of investments in other relevant sectors is considered, namely the territorial allocation of investments within explicit regional policy, investments in universities and the R&D sector, and finally investment assigned to the environmental sector.

6.1. Regional analysis of total capital expenditure

The regional analysis of total capital expenditure financed from the central level (i.e. from the state budget and from both state extra-budgetary funds) in the period 1995–2005, includes nearly CZK 617 billion after the data has been 'cleaned' by the above described procedure. The nature of the capital expenditure determined that such invested funds were used primarily for development activities, and allocation of such investments has an undoubted dynamic effect on the relevant regions (e.g. SHORT, 1981; AUTERI and COSTANTINI, 2004).

The overall spatial pattern of the regional distribution of the analysed funds can be considered as significantly unbalanced. In the period studied, over one quarter of the analysed investments (which in absolute terms represents approximately CZK 168 billion) were allocated from the national level into the capital city of Prague, socio-economically the most advanced region of the Czech Republic (for regional GDP per capita see Figure 2). The dominance of Prague is also proved by relative indicators, i.e. investments per inhabitant (approximately CZK 142 thousand per inhabitant, which is 237% of the average for the Czech Republic - see Table 5). With respect to economic performance indicators, i.e. after putting capital expenditure in relation to the regional GDP level, it was 116% of the average allocation of the Czech Republic and in relation to the economic aggregate it was 123% of the

national average. The term economic aggregate was defined by HAMPL (2005) as the product of the number of jobs (the number of jobs is determined as the number of economically active persons after deducting the unemployed and adding the commuting balance calculated on the basis of the 2001 Census) and the average wage in the region in question. The Plzeňský and Olomoucký regions achieved an even higher investment allocation than Prague with respect to GDP (136%, resp. 137% - see Table 5), and the same order applies when the allocated investment volume is related to the economic aggregate.

Table 5: Capital expenditure per capita and per regional GDP (1995–2005, in %)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

6.2. Regional analysis of total capital expenditure after exclusion of transport investment

Since the extraordinary volume of investment devoted to transport infrastructure (CZK 222 billion from the state budget and from the State Fund for Transport Infrastructure – see Table 4) which undoubtedly influences the overall picture of the regional allocation of investment, such expenditure was excluded from the analysis in the following stage. The remaining investment projects thus represent approximately CZK 395 billion for the period of 1995–2005 again.

After the exclusion of projects in the transport infrastructure sector, the position of Prague is even higher (see Table 5). In absolute terms, its share of public capital expenditure in the Czech Republic actually increased to 37.5%, while in per capita terms the investment allocation to Prague was 326% of the average value for the Czech Republic. No other NUTS 3 region received an above-average allocation per inhabitant. Even when the allocated

investment projects are related to the regional GDP, the Prague region is still above the national average (see Table 5). Investments in Prague were directed particularly to the state administration (approximately CZK 55 billion), state defence (CZK 24 billion), health service (CZK 18.1 billion), infrastructure development (CZK 18.9 billion) as well as public city transport (4.8 billion CZK), R&D (CZK 6.9 billion) and education (CZK 8.7 billion).

As all data except for that on transport infrastructure projects was territorially identified up to NUTS 4 level, a detailed analysis of the regional distribution of capital expenditure, after exclusion of transport expenditure, could be carried out on the NUTS 4 level regions. At this hierarchical level, Prague dominates absolutely. The district of Kutná Hora achieved the second highest allocation per inhabitant and the highest allocation per economic aggregate, but this was thanks to extraordinary investments in the military air force base in Čáslav. The district of Brno–město (after Prague the second most important economic centre of the Czech Republic) is in third position with 162% of the average allocation per inhabitant. Brno also achieved the second highest share of 6%. The districts of Ostrava-město (2.2%), Olomouc (2.6%) and Plzeň-město (2.2%) also received significant shares. Other districts received only minor allocations.

Where capital expenditure was considered per inhabitant, above-average investments compared to the average for the Czech Republic were allocated to only 11 out of 77 districts, and 22 districts did not even achieve 50%. The regions receiving significantly below-average investment funds per inhabitant include the majority of districts in North-Western Bohemia and Northern Moravia (which, however, are mostly among the regions supported within Czech regional policy – see Figure 2), the internal periphery, as well as a large area of

Southern, Western, Northern and Eastern Bohemia and the Czech-Slovak borderland (see Figure 3).

Figure 2: Assisted regions supported within Czech explicit regional policy

Source: Ministry for Regional Development.

(about here)

Figure 3: Capital expenditure per capita after exclusion of transport infrastructure in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

Due to the unavailability of GDP data for NUTS 4 regions and the limited reliability of this indicator on the NUTS 3 regions, GDP was replaced by an economic aggregate. At regional level, this indicator achieves a very high correlation with regional GDP (0.998). After putting the allocated investment funds in relation to the economic aggregate (see Figure 4), Prague achieved 169% of the average for the Czech Republic (the highest allocations went to the districts of Kutná Hora - 257% and Prostějov - 170%, in both cases thanks to extraordinary investments in the defence sector). Highly uneven distribution of this expenditure illustrates well the fact that above-average values were achieved by only 13 districts, among which was also the second largest city (district Brno-město - 119 %).

Figure 4: Capital expenditure per economic aggregate after exclusion of transport infrastructure investments in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

(about here)

6.3. Capital expenditure in the transport sector

The extraordinary importance of investment devoted to the transport infrastructure is given by their very high volume (CZK 222 billion), which represents approximately 36% of the volume of the investment observed in this study. In addition, it is obvious that the regional formula of transport constructions, often linear in nature, may significantly differ from the spatial formula of other investment projects. For this reason, the transport sector was chosen for a separate regional analysis (i.e. investment in construction of motorways, expressways, railway corridors, and the underground in Prague). Despite a number of methodological constraints, it was possible to unite the two most important sources of funds for this sector: the state budget (i.e. ISPROFIN) and the State Fund for Transport Infrastructure. The total analysed investment volume of 1995–2005 exceeds CZK 222.3 billion (ISPROFIN – CZK 96.7 billion, the State Fund for Transport Infrastructure – CZK 125.5 billion), and the data are available only for NUTS 3 regions.

Figure 5 illustrates the considerably above-average allocation of investment in transport in Western Bohemia, which corresponds to the hypothesis of allocation of investment along a traditional west-east gradient in the level of socio-economic development. In transport investment, this gradient is raised by the effort to ensure transport connections for the Czech Republic or its capital of Prague with nearby economic centres in Germany (Munich, Frankfurt, Berlin). Although the area of Northern Moravia is a structurally affected region, as is North-Western Bohemia, transport investment has flowed more to Northern Bohemia in recent years, because the transport connection with Poland was of less priority than connections to Germany or Western Europe.

Figure 5: Transport infrastructure investment per capita in NUTS 3 regions, 1995–2005, Czech Rep. = 100 % (in %)

Source: ISPROFIN, SFTI, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

(about here)

The spatial formula for the allocation of per capita investment in transport is very similar to the case where transport investment is related to GDP (the correlation coefficient is 0.954). In both indicators the position of Prague is well below national average (78%, resp. 38% of the Czech Republic average). On the contrary, Plzeňský, Olomoucký, Ústecký and Karlovarský regions achieved significantly above-average allocations. However, in evaluating the regional distribution of transport infrastructure investments (and of general investments as well) it is necessary to consider the time aspect in the sense that if a significantly higher amount of funds is granted to a region in a certain time range, it may mean that the necessary infrastructure had not previously been constructed in the region in question and it is being built behind schedule or out of needs arising from the different geopolitical orientation of the Czech Republic after the fall of the Iron Curtain. For example, as early as the communist era, the D1 motorway was completed between Prague and Brno, leading across the Vysočina region, so this region records a significantly below-average allocation, while in the districts of Tachov and Plzeň-jih districts, the D5 connecting Prague and Bavaria was built during the period considered here.

The regional distribution of capital expenditure after the exclusion of transport infrastructure investments when related to the economic level of the region (GDP) shows that transport investments are what “aid” economically weaker regions to reach above-average values. If transport investments are not considered, Prague is quite clearly the region that gains most

from redistribution of public investment both in per capita terms and in relation to GDP (116 %, or 159 % of the Czech Republic average - see Table 5).

6.4. Capital expenditure allocated within explicit regional policy

Since one of the aims of this article is to show a significant discrepancy between the regional formula for the allocation of public investment funds within non-regional policies and regional policy, this is presented by Figure 6 which shows investments granted to explicit regional policy from the state budget. Strikingly, the funds allocated within regional policy are spread widely across the whole territory of the Czech Republic. This is in sharp contrast with the very conception of regional policy as a policy which supports only selected regions. This finding cannot be justified by changes of assisted areas over the investigated period as there was considerable stability of both the regional pattern of lagging and leading regions and consequently also of assisted areas delineated for the sake of regional policy (BLAŽEK, 2005b). On the other hand, the pattern of investment within regional policy does confirm that a certain priority was given to the assisted areas. Namely, the Moravian districts, especially the southern and, to some extent, northern ones ranked among the largest recipients of such investments (together with North-Western Bohemia they rank among the regions supported within Czech explicit regional policy, as does Northern Bohemia to some degree). Nevertheless, it is necessary to mention a paradox as a statistically highly significant positive relation of regional policy investment to regional GDP and to the economic aggregate was demonstrated for NUTS 3 regions (in both cases excluding Prague - see Table 6a). The same applies also to the level of NUTS 4 regions (see Table 6b) where a statistically significant positive relation was found between the regional policy capital expenditure and the level of economic development measured by the economic aggregate as a proxy for regional GDP. At the same time, a larger part of Moravia ranks, with other regions supported within explicit

regional policy, as an area significantly underfinanced with respect to the total investment from the state budget after the exclusion of transport. In simple terms, districts supported within the explicit regional policy in the Czech Republic received only a very limited volume of investment from the national level (after the exclusion of transport constructions) (compare Figures 2, 3 and 4). On the other hand, support within Czech regional policy was significantly concentrated into these regions (see Figure 6). However, a huge difference in the financial sums invested has to be stressed again: CZK 7.2 billion for regional policy versus the total volume of the analysed funds amounting to CZK 617 billion. Nevertheless, although the volume of investments for regional policy at the national level is nearly negligible, its importance is significantly higher for the supported regions.

Figure 6: Capital expenditure per capita from the state budget devoted to explicit regional policy in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Table 6a: Correlation of selected indicators for NUTS 3 regions (n=13 – Prague excluded)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

Table 6b: Correlation of selected indicators for NUTS 4 regions (n=76 – Prague excluded)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

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6.5. Capital expenditure for higher education, R&D and the environmental sector

Within the regional analysis of capital expenditure from the state budget of the Czech Republic, sectoral analyses were also carried out. As an example, Figure 7 shows investment

from the state budget in the infrastructure of universities and colleges and other R&D institutions amounting to approximately CZK 25 billion. The expected regional distribution of such expenditure into economically more developed regions (Prague, Brno) and to regions where a public college is located, or to regions with headquarters of important research institutes (the Prague hinterland) was demonstrated (similar regional pattern of public R&D expenditure was shown by WISHLADE *et al.* 1996 or THE ESPON MONITORING COMMITEE 2005). Nevertheless, it is necessary to point out that it is not only capital expenditure from the central level that is devoted to this sector. For example, it was not possible to obtain data on the regional allocation of financial support for R&D projects allocated by the Grant Agency of the Czech Republic. In addition, it is necessary to take into account a frequent methodological problem, when some analysed data are allocated according to the headquarters of the institution in question, although such funds may then be invested in branches of the institution in a different region. It is thus probable that in fact investment in higher education and R&D is less concentrated than the data analysed shows.

Figure 7: Capital expenditure per capita of the state budget devoted to universities and for R&D institutions in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %)

Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Figure 8 shows investment in the environment sector amounting to CZK 25.6 billion allocated both from the state budget and the State Environmental Fund. Although no clear relation between the distribution of funds and environmental quality has been shown, we may confirm to some extent that investment was allocated to regions in which it is necessary to solve a specific problem with respect to the environment (e.g. support of mining reduction, revitalising the river system, pond reconstructions).

A surprisingly high allocation of investment to border districts in South-Western Bohemia relates to investment in the territorially largest national park in the Czech Republic (The Šumava National Park). Figure 8 provides, however, a surprising finding, that investment projects in the environment sector are not greatly concentrated in the structurally handicapped regions in Northern Bohemia and in Northern Moravia where the environment is seriously damaged. There is one exception with high investment - the Česká Lípa district - where the running down of the uranium industry and subsequent cultivation of the area are jointly in progress.

Figure 8: Environmentally related capital expenditure per capita of the state budget in 1995–2005 and of the State Environmental Fund in 1999–2005 in NUTS 4 regions, Czech Rep. =100 % (in %)

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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6.6. Relation of capital expenditures to selected socio-economic variables

On the basis of correlation coefficients for selected indicators for NUTS 3 regions (Table 6a) we can demonstrate a statistically significant relation between all regional allocations of investment via all analysed categories of investment (i.e. total investment, total investment after exclusion of transport investment, transport investment, investment into R&D and universities and regional policy investment, and their economic performance expressed by the GDP and the economic aggregate. The same finding counts for correlation coefficients for NUTS 4 regions (Table 6b), however, due to data limitations only the correlation between 3 investment categories and the economic aggregate could be calculated. It is important to stress again that with respect to the declared objectives of Czech regional policy, the correlation

between the share of investment allocated within explicit regional policy and economic performance should be negative. However, on both NUTS 3 and NUTS 4 level regions positive and even statistically significant values were obtained indicating that even allocation of investment within regional policy is not in line with its own strategic objective.

The identification and detailed assessment of factors behind these observed patterns goes beyond the focus of this paper, however at least a brief discussion should be included. In countries like the Czech Republic which are lacking instruments for the systematic evaluation of the effectiveness and efficiency of planned public investment, a relatively important role can be assumed for subjective factors. The decision making process on public investment committed from the central level basically proceeds at two levels. Firstly, on the basis of a proposal of the Ministry of Finance, the Government and Parliament decide about financial allocations to particular sectors that come under the responsibility of particular ministries. Secondly, there is a process of selection of priorities by a particular ministry. In this case, three main factors influencing the decision making process on public investments might be identified: i) the adopted strategy for a specific sector (inevitably even these strategic documents can to some extent reflect subjective factors), ii) the interests of (esp. high-ranking) public servants and iii) the interests of politicians. On the basis of our experience of more than 10 years of contractual cooperation by one of the authors with one central administration body we can draw two preliminary conclusions. First, the relevance of these three types of factors differs widely among different sectoral policies. Second, in some cases each of the three above mentioned factors can be decisive. This, therefore, makes a clear case for the introduction of some instruments (including TIA) that would be able to "objectivise" the need for public investment.

7. Conclusions and policy implications

The article aims to contribute to the debate on the regional dimension of sectoral (non-regional) governmental policies and to empirically demonstrate the huge discrepancy between both the volume and regional pattern of public capital expenditure committed within the national sectoral policies on the one hand and the official regional policy on the other. The performed analyses focused "only" on the public capital expenditures allocated by the Government of the Czech Republic, but it can be claimed that public capital investments have the most important implications for the development of particular regions (SHORT, 1981; YAMANO and OHKAWARA, 2000). Obviously, the financial volume of the total public capital expenditure is incomparably higher than the financial volume allocated to explicit regional policy.

The regional analyses performed were based on the dataset of public capital expenditure in the Czech Republic covering the years 1995–2005 and demonstrated uneven regional distribution of these investments in favour of the most economically developed region of the Czech Republic – the capital city of Prague. Such a regional pattern for the distribution of public investment supports the hypothesis that there exists a contradiction between the regional impact of sectoral policies on the one hand, and the goals of explicit regional policy on the other. The discrepancy between these two is particularly striking as assisted regions delineated for the sake of national regional policy were to a large extent left aside by decisions regarding the allocation of public capital expenditure (with the exception of expenditure on transport infrastructure). Moreover, a surprising pattern was identified even in the case of investment committed within explicit regional policy (Fig. 6) which is not coinciding well with the map of assisted areas (Fig. 2). Clearly, the allocation of regional policy investments is not respecting fully the objectives of regional policy itself.

Consequently, there is a clear conflict between the goals of explicit regional policy aiming at the support of less well-off regions and mostly unintended regional impacts of much more vigorous non-regional governmental policies generally supporting the most developed regions. These findings are in line with research performed by e.g. WILSON and WISE (1986) but in contrast with results of YAMANO and OHKAWARA (2000).

However, it is necessary to stress that from the point of view of the entire expenditure side of the governmental policies comprising both capital and current expenditure, the region of Prague is very likely the most important net payer into the system of public finance due to its buoyant tax base and to its relatively low share of persons receiving social benefits (see OUŘEDNÍČEK and NOVÁK, 2006). Nevertheless, it is clear that the uneven distribution of public capital expenditure, generally favouring more developed regions, is one of the most important mechanisms of regional differentiation and is, moreover, cumulative in nature.

The expectation of a replication of the traditional East-West gradient in the level of socio-economic development by the regional structure of total capital expenditure has not been experienced. However, the evidence supporting this expectation can be observed in the case of the capital expenditure allocated to transport infrastructure. The greater support of transport infrastructure projects in the Western part of the Czech Republic is a reflection of the priority assigned to connecting the Czech Republic to Western European structures.

Key implications deriving from the conducted regional analysis relate in particular to the necessity of developing a sound methodology for the territorial impact assessment of public policies and programmes. In other words, it is essential to develop a procedure evaluating not only the regional impact of incentives carried out within explicit regional policy (which is

already becoming common practice in the most developed countries) but also the impact of public interventions which do not explicitly incorporate a regional dimension but where implementation might have a significant regional impact. Such an evaluative instrument is essential for tackling of regional development issues and problems more effectively by achieving synergies and eliminating contradictions between different policies (SCHÄFFER, 2005; CEC, 2006a, 2006b). Nevertheless, this approach is a real challenge due to the fact that public policies in most advanced countries are traditionally being implemented via sectorally structured public administration at central governmental level while the relevance of sectoral policies for development of particular regions has been clearly underestimated (ROBERT *et al.*, 2001; MACEŠKOVÁ, 2007).

Despite the effort that has been put into developing TIA methodology, no comprehensive and satisfactory tool for regional impact assessment has yet been developed. Therefore, as also documented by our empirical results, which showed both an uneven spatial pattern of the allocation of public capital expenditure and a huge mismatch between the regional pattern of this expenditure and the assisted regions, the development of a suitable instrument for territorial/regional impact assessment and its application at least to the most relevant sectoral policies remains a critical challenge for both researchers and decision-makers.

[i] Such fine-tuning can take many different forms, for example differentiation of the form and the rate of public support or the involvement of regional self-government or other regional bodies in decision-making procedures, although in practice such an approach is rather rarely applied.

[ii] Except for the programmes set by a special act such as state support to the national cultural heritage or agriculture.

Regional analysis of public capital expenditure: to which regions is public capital expenditure channelled – to "rich" or to "poor" ones?

Abstract

The paper aims to contribute to the debate on the regional dimension of sectoral (i.e. non-regional) policies and to empirically demonstrate the huge discrepancy between both the volume and the regional pattern of sectoral public capital expenditure policies on the one hand, and official regional policy on the other. The analyses were based on a unique database of public investment in the Czech Republic covering the years 1995–2005. Their results show significant conflicts in policy objectives and thus represent a clear argument in favour of pursuing territorial impact assessment (TIA) of sectoral policies.

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Key words: regional impact of non-regional policies, sectoral policies, territorial impact assessment, regional policy, public investments, Czech Republic

JEL classifications: H5, E61, R 11, R 58

Acknowledgements

This paper received financial support from Research Programme No. MSM 0021620831 sponsored by the Czech Ministry of Education, Youth and Sport. The authors would like to thank to two anonymous referees for their helpful comments.

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1. Introduction

The aim of the paper is to contribute to the debate on the regional dimension and the regional impact of sectral public capital expenditure policies. This debate started decades ago (e.g. SHORT, 1978; BENNETT, 1980; MARTHUR and STEIN, 1980; MOLLE and CAPPELLIN,

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1988) but recently received a significant impetus in the form of a discussion on the regional impact of sectoral policies and the possibilities of their "regionalization" (e.g. DG RESEARCH, 1991; MARTIN, 1999; ROBERT *et al*., 2001; MOLLE, 2007). The "regionalization" of sectoral policies can be understood as the fine-tuning of sectoral public expenditure according to the needs and circumstances of specific regions.[i] One of the important results of this discussion was the gradual development of the methodology of the territorial impact assessment of large projects and later, also of programmes and policies – SCHINDEGGER and TATZBERGER, 2003; CAMAGNI, 2006). The increasing attention being paid to the regional dimension of public expenditure policies stemmed originally from the effort to learn how to improve or - more precisely - how to ensure the coordination of the territorial impact of the EU policy of economic and social cohesion (ESC) and of other European policies (e.g. CEC, 1996; SHOUT and JORDAN, 2007). Moreover, at the same time, there was a significant research endeavour to discover to what extent the regional impact of ESC policy has been in compliance with the spatial effects of numerous national public policies of the EU Member States (CEC, 2004).

Nevertheless, the number of existing analyses of the regional impact of sectoral policies is still relatively limited (for exceptions see e.g. HEALD, 1994; AUTERI and COSTANTINI, 2004; KATAOKA, 2005; MACEŠKOVÁ, 2007), mostly due to the severe data limitations in most countries. Therefore, the main aim of this article is an attempt to perform an analysis of the regional dimension of public capital expenditure in one of the new Member States (the Czech Republic) at the level of the NUTS 3 and 4 regions. This analysis is based on a unique data set of capital public expenditure covering investment projects supported during 1995–2005.

The analyses undertaken here are aimed at answering several research questions. Firstly, the relation between the level of the socio-economic development of the regions and the amount of invested public capital expenditure will be investigated. It is assumed that

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public investments are highly concentrated in the most socio-economically developed regions. Such a regional allocation of this type of public funds would be in accordance with the principles of a strategic regional policy (for more on strategic regional policy see e.g. GORZELAK, 1992). In other words, given the many deficiencies in the sphere of the technical and other infrastructures inherited from the communist period, it is supposed that public investment was primarily focused on the enhancement of the infrastructure in major cities and namely in Prague to strengthen the gateway effect (DRBOHLAV and SÝKORA, 1997) and to enhance the competitiveness of the national metropolis on the international scene.

Moreover, another reason for the anticipated concentration of public investment in core regions is the assumed the higher efficiency of investment in these regions (e.g. CAMINAL, 2004; DE LA FLUENTE, 2004). Therefore, a positive correlation between the level of socio-economic development and the amount of public capital invested (relative per capita) is expected. However, it should be stressed that such a regional pattern of public investment contradicts the objectives of the Czech national strategy for regional development and of regional policy aiming at decreasing regional disparities and being in compliance with the "insurance" type of regional policy (MRD, 2006; GORZELAK, 1992). As a result, it can be argued that there is an immense policy conflict between goals of explicit regional policy and mostly unintended spatial impacts of much more vigorous non-regional governmental policies. Therefore, our analyses might also serve as empirical support for the importance of pursuing territorial impact assessment (TIA), both for major public capital projects and for sectoral policies as a whole.

Secondly, a replication of the traditional East-West gradient of socio-economic development by the regional structure of capital expenditure is also expected (for more on the East-West gradient, see BLAŽEK and CSANK, 2007).

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Obviously, given the fact that public capital expenditure is highly "visible", the allocation is inevitably subject to challenge in the political arena, and a significant role of subjective and "soft" factors in the regional allocation of this expenditure is envisaged. Despite the fact that the available data does not allow for a thorough explanation of the obtained result, the potentially most important explanatory factors are identified.

Finally, it is believed that a detailed scrutiny of the regional structure of public expenditure significantly helps our understanding of regional development.

The paper is structured as follows. Firstly, the theoretical debate and the most important findings of previous studies are summarized. Next, the data and the methodology are described. Thirdly, the main findings of the empirical analyses of public capital expenditure on the NUTS 3 and NUTS 4 levels are provided and discussed. Finally, conclusions and policy implications are drawn.

2. Regional impact of fiscal policy and its sectoral policies

The subject of public finance and fiscal policy is an important and traditional sphere of research for economists (e.g. MUSGRAVE and MUSGRAVE, 1973; ATKINSON and STIGLITZ, 1980), nevertheless, geographers have also been interested in this sphere for several decades (for example BENNET, 1980; HEALD, 1994; BLAŽEK, 1995). While economists often build models of public sector spending and frequently deal with the issue of the efficiency of public sector spending, geographers tend to derive the implications of public finance for regional development (for example BLAŽEK, 1995; PORTEOUS, 1995).

Obviously, fiscal policy as a whole has a huge regional impact, depending on the design of both the revenue and expenditure sides of the state budget. However, the regional patterns of both revenue and expenditure are unknown in most countries. Generally, it can be expected that a system of progressive taxation reduces revenues in more affluent regions

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while social benefits tend to flow into the less well off regions, representing an important mechanism for interregional redistribution (PRUDHOMME, 1993; WISHLADE *et al.*, 1996). The regional redistribution of financial resources via fiscal policy is one of the important factors contributing to the economic growth of the respective regions (LEFEBER, 1964; GUISÁN and CANCELO, 1996) and helps the social stabilization and internal cohesion of the country in question (DE LA FLUENTE, 2004). Nevertheless, in the case of the regional allocation of capital expenditure, there is even less certainty about the actual regional pattern of this expenditure than in the case of current expenditure.

Authors focusing on analyses of the impact of fiscal policy on the growth of particular regions arrive at the conclusion that public investments are having measurable positive effects on the respective regions (e.g. MARTHUR and STEIN, 1980; FŐLSTER and HENREKSON, 2001; AUTERI and COSTANTINI, 2004). Other studies are devoted to the investigation of efficiency issues (for example GUISÁN and CANCELO, 1996; DE LA FLUENTE, 2004). Other authors point to the problem of the insufficient coordination of different public policies and activities, as their goals and effects can be overlapping or even contradictory (e.g. WISHLADE *et al.,* 1996; MARTIN, 2005; SHOUT and JORDAN, 2007). In addition, some other studies have dealt with issues of social justice or equity within the sphere of public finance (e.g. BOYN and POWELL, 1995).

One country where the allocation of public money attracts considerable attention from both politicians and analysts is the UK. However, the main rationale for these studies is mainly the issue of the distribution of public expenditure between England, Wales, Scotland and Northern Ireland in the context of devolution (e.g. SHORT, 1978; HEALD, 1994; HEALD and SHORT, 2002; MIDWINTER, 2004). In Japan, KATAOKA (2005) assessed the regional distribution of public investments between 47 prefectures in the post-war period. Kataoka noticed that periods of high national economic growth are positively correlated with the

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concentration of public investment into economically strong regions while in periods of low growth, a more balanced distribution of public capital expenditure has been observed. WILSON and WISE (1986) studied the regional implications of public investment in a developing country – Peru – over the period 1968–1983. They showed a high concentration of public investment into the rich coastal regions during three subsequent time periods, while a shift in favour of the poorer inland regions was observed in the second half of the period studied. However, according to these authors, this shift is mainly attributable to the huge investments in the mining industries in the inland regions.

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3. Sectoral policies and regional policy

There have already been voices among experts suggesting that the regional impact of vigorously pursued sectoral policies is much more profound than the regional impact of regional policy itself (e.g. ROBERT *et al.*, 2001; MARTIN, 2005). Therefore, within this context, some authors distinguish regional policy in a "narrow" and "broad" sense, while other authors prefer the terms "explicit" and "implicit" regional policy (e.g. ARMSTRONG and TAYLOR, 1985; CUADRADO, DE LA DEHESA and PRECEDO, 1993). While it can be agreed that regional policy in a "narrow" sense is synonym with explicit regional policy, the difference between implicit regional policy and a regional policy in a "broad" sense should be stressed. Implicit regional policy encompasses public policies which have been to a certain extent "regionalized" (i.e. there has been some sort of adjustments of an overall design of sectoral or non-regional policy in question to meet specific regional conditions and needs). Regional policy in a "broad" sense, on the other hand, comprises of all public policies or actions executed by the public sector which have important regional impacts and this importance is to some extent recognized (e.g. agricultural policy, transport policy, energy policy, competition policy, science and technology policy). Despite the fact that these policies often lack an

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explicit definition of regional goals, they are clearly having a specific impact on different regions (e.g. CUADRADO, DE LA DEHESA and PRECEDO, 1993; EUROPEAN COMMISSION, 1998, 2004; HILL and LOWE, 2007). Examples of public policies that reflect at least some specific regional characteristics or which react to specific regional conditions are the policy aimed at attracting large investors to the Czech Republic (UHLÍŘ, 2004) or the R&D policy in Germany (see KOSCHATZKY, 2001). Considerable attention has been paid to the regional impact of sectoral policies and analogous policies at EU level in studies undertaken within the ESPON programme (e.g. THE ESPON MONITORING COMMITTEE 2005).

BLAŽEK (2005a) argues that one key component of fiscal policy that has an enormous regional impact is the way the decentralized public administration bodies (municipalities and regions) are financed. For example, in 2007, within the state budget of the Czech Republic only CZK 1.5 bln was allocated to explicit regional policy (which represents only 0,06 % of Czech GDP), while in the same year the state distributed more than CZK 160 bln to municipalities and regions via a strictly egalitarian tax-sharing formula (this volume amounts 7,7% of Czech GDP). It is clear that the principles upon which the applied model of financing local and regional government in particular countries rests are of tremendous importance and consequently, due to the vast amount of money concerned, the system of local government financing has a much more profound regional impact than official "explicit" regional policy.

Moreover, important regional impacts can be attributable even to non-spending policies, for example to an anti-monopoly policy. WISHLADE *et al.*, (1996) consider the spatial impact of non-spending policies as "blind spots" of regional analyses.

4. The budgetary scheme of the Czech Republic

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The budgetary scheme of the Czech Republic consists of two prime components – public budgets and extra-budgetary funds created for specific investment purposes such as transport infrastructure, and expenditure on environmental projects, (see Figure 1).

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Figure 1: Simplified budgetary scheme of the Czech Republic

Source: modified on the basis of PEKOVÁ (2002), p. 79

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Nevertheless, due to the focus of this paper on the identification of spatial patterns in the allocation of public capital expenditure, the analysis was limited to a regional analysis (at the level of the NUTS 3 and NUTS 4 regions) of capital investment allocated from central sources, i.e. from the state budget and from state extra-budgetary funds. The Czech state budget operates with the dominant part of public finance assigned to public budgets, but as Table 1 illustrates, the share of state budget allocated to capital expenditure is rather small. This fact can be partly explained by the key role of state extra-budgetary funds in the case of such expenditure (see Table 2), as they are designed to function as a vehicle allowing the implementation of multi-annual projects, while the state budget in principle provides the financial framework for one year only. In addition, a noteworthy volume of public capital expenditure flows through decentralized public budgets, and especially via municipal budgets (on average in 2000–2005 the capital expenditure of decentralized public budgets accounted for CZK 74.2 bln per year, which represents 28.5 % of the total decentralized public budgets on average per year). Nonetheless, in line with our research focus the analysis presented below concentrates only on the capital expenditure allocated from the central level.

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Table 1: Expenditure of the Czech state budget in 1995–2005 (current prices, in billion CZK, in %)

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Note: In December 2007, the exchange rate was approx. 1 EUR = 27 CZK.

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Table 2: Expenditure from selected state extra-budgetary funds in 2000–2005 (current prices, in billion CZK)

Source: Statistical Yearbook of the Czech Republic 2000–2006.

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5. Data and Methodology

The prime source for this regional analysis of the capital expenditure of the state budget of the Czech Republic is the ISPROFIN (Information System of Programming Funding from the State Budget) database, which comprises data regarding investment spending from the state budget, in our case for the years 1995–2005. ISPROFIN is managed by the Ministry of Finance of the Czech Republic and has been operational since 1995.[ii] The structure of the entries into ISPROFIN allows a regional break-down of capital expenditure at the level of the NUTS 3 and 4 regions. However, several methodological problems arose during the analysis of this data, and consequently a number of projects and programmes (and the corresponding financial volume of capital expenditure) had to be excluded from the analysis. The following criteria for omitting particular projects or programmes were applied: i) the regional allocation of the investment incentives was not given or investment was implemented abroad; ii) the project or programme was predominately for current expenditure; iii) the project was of an "extraordinary" nature (i.e. expenditure devoted to the recovery of the territories affected by the 1997 and 2002 floods or devoted to the restitution to former owners of private property that was nationalized during the communist period).

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An overview of the financial amounts included (and excluded) from the regional analysis of public capital expenditure is given in Table 3. Another methodological challenge was represented by projects which benefited the whole country, but in ISPROFIN were assigned to one region only. This was especially the case for the purchase of jet fighter aircraft which were also excluded from the analysis.

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This problem relates to the fundamental methodological question of which principle investment expenditure should be attributed to a certain region. For instance, SHORT (1978) has explicitly distinguished two types of regional expenditure: "regionally relevant" and "total expenditure" allocated to the region. According to Short, "regionally relevant" expenditure benefits only the region in which the particular public money was allocated. Alternatively, WISHLADE *et al.*, (1996) and also CAMINAL (2004) differentiated between the "flow" and "benefit" approaches to the analysis of the regional distribution of public expenditure. The "flow" approach assigns expenditure to regions regardless of whether or not the region in question is an "end user", while the "benefit" approach concentrates on the end users of the public money spent, or more precisely on the final beneficiary regions. Consequently, in our analysis, the flow approach has been applied as it would be impossible to judge each of the approximately 40,000 investment projects of ISPROFIN included in the analysis on the basis of the benefit approach.

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Table 3: Financial resources of ISPROFIN 1995–2005 (in billion CZK, current prices, in %)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), authors` calculations.

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In addition to ISPROFIN, which covers capital expenditure financed from the state budget, the two most relevant extra-budgetary funds were incorporated into our analysis. These two funds are: The State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF). The data on the individual projects supported by these funds were obtained from the responsible institutions. In the case of the State Fund for Transport Infrastructure, the capital expenditure for 2001–2005 has been analysed at the level of NUTS 3 regions. Investment projects to a total value of CZK 222.3 billion were included in the analysis. The State Environmental Fund is represented by the data concerning expenditure during the years 1999–2005, which amounted to CZK 13 billion. Therefore, this analysis covers capital expenditure from the state budget and from two extra-budgetary funds to a total value of CZK 617 bln. The analysis was structured into six parts, covering the most relevant thematic spheres of public capital expenditure (see Table 4).

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Table 4: Overview of the analyzed data for the period 1995-2005 (in billion CZK, current prices)

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), Internal materials of the State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF), authors` calculations.

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6. Results

In this section, the main results of the regional analysis of capital expenditure committed within the sectoral governmental policies in the Czech Republic will be presented (Table 4 provides an overview of the financial volumes analysed). First, attention is paid to an analysis of the distribution of all capital expenditure, that is an analysis of investment projects financed from the state budget and from relevant state extra-budgetary funds. In view of the fact that

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the overall nature of regional differentiation of investment allocation is considerably influenced by investments in the transport infrastructure, in the next stage such investments are excluded from the analysis and analysed separately. Next, the regional allocation of investments in other relevant sectors is considered, namely the territorial allocation of investments within explicit regional policy, investments in universities and the R&D sector, and finally investment assigned to the environmental sector.

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6.1. Regional analysis of total capital expenditure

The regional analysis of total capital expenditure financed from the central level (i.e. from the state budget and from both state extra-budgetary funds) in the period 1995–2005, includes nearly CZK 617 billion after the data has been 'cleaned' by the above described procedure. The nature of the capital expenditure determined that such invested funds were used primarily for development activities, and allocation of such investments has an undoubted dynamic effect on the relevant regions (e.g. SHORT, 1981; AUTERI and COSTANTINI, 2004).

The overall spatial pattern of the regional distribution of the analysed funds can be considered as significantly unbalanced. In the period studied, over one quarter of the analysed investments (which in absolute terms represents approximately CZK 168 billion) were allocated from the national level into the capital city of Prague, socio-economically the most advanced region of the Czech Republic (for regional GDP per capita see Figure 2). The dominance of Prague is also proved by relative indicators, i.e. investments per inhabitant (approximately CZK 142 thousand per inhabitant, which is 237% of the average for the Czech Republic - see Table 5). With respect to economic performance indicators, i.e. after putting capital expenditure in relation to the regional GDP level, it was 116% of the average allocation of the Czech Republic and in relation to the economic aggregate it was 123% of the

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national average. The term economic aggregate was defined by HAMPL (2005) as the product of the number of jobs (the number of jobs is determined as the number of economically active persons after deducting the unemployed and adding the commuting balance calculated on the basis of the 2001 Census) and the average wage in the region in question. The Plzeňský and Olomoucký regions achieved an even higher investment allocation than Prague with respect to GDP (136%, resp. 137% - see Table 5), and the same order applies when the allocated investment volume is related to the economic aggregate.

Table 5: Capital expenditure per capita and per regional GDP (1995–2005, in %)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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6.2. Regional analysis of total capital expenditure after exclusion of transport investment

Since the extraordinary volume of investment devoted to transport infrastructure (CZK 222 billion from the state budget and from the State Fund for Transport Infrastructure – see Table 4) which undoubtedly influences the overall picture of the regional allocation of investment, such expenditure was excluded from the analysis in the following stage. The remaining investment projects thus represent approximately CZK 395 billion for the period of 1995–2005 again.

After the exclusion of projects in the transport infrastructure sector, the position of Prague is even higher (see Table 5). In absolute terms, its share of public capital expenditure in the Czech Republic actually increased to 37.5%, while in per capita terms the investment allocation to Prague was 326% of the average value for the Czech Republic. No other NUTS 3 region received an above-average allocation per inhabitant. Even when the allocated

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investment projects are related to the regional GDP, the Prague region is still above the national average (see Table 5). Investments in Prague were directed particularly to the state administration (approximately CZK 55 billion), state defence (CZK 24 billion), health service (CZK 18.1 billion), infrastructure development (CZK 18.9 billion) as well as public city transport (4.8 billion CZK), R&D (CZK 6.9 billion) and education (CZK 8.7 billion).

As all data except for that on transport infrastructure projects was territorially identified up to NUTS 4 level, a detailed analysis of the regional distribution of capital expenditure, after exclusion of transport expenditure, could be carried out on the NUTS 4 level regions. At this hierarchical level, Prague dominates absolutely. The district of Kutná Hora achieved the second highest allocation per inhabitant and the highest allocation per economic aggregate, but this was thanks to extraordinary investments in the military air force base in Čáslav. The district of Brno–město (after Prague the second most important economic centre of the Czech Republic) is in third position with 162% of the average allocation per inhabitant. Brno also achieved the second highest share of 6%. The districts of Ostrava-město (2.2%), Olomouc (2.6%) and Plzeň-město (2.2%) also received significant shares. Other districts received only minor allocations.

Where capital expenditure was considered per inhabitant, above-average investments compared to the average for the Czech Republic were allocated to only 11 out of 77 districts, and 22 districts did not even achieve 50%. The regions receiving significantly below-average investment funds per inhabitant include the majority of districts in North-Western Bohemia and Northern Moravia (which, however, are mostly among the regions supported within Czech regional policy – see Figure 2), the internal periphery, as well as a large area of

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Southern, Western, Northern and Eastern Bohemia and the Czech-Slovak borderland (see Figure 3).

Figure 2: Assisted regions supported within Czech explicit regional policy

Source: Ministry for Regional Development.

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Figure 3: Capital expenditure per capita after exclusion of transport infrastructure in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Due to the unavailability of GDP data for NUTS 4 regions and the limited reliability of this indicator on the NUTS 3 regions, GDP was replaced by an economic aggregate. At regional level, this indicator achieves a very high correlation with regional GDP (0.998). After putting the allocated investment funds in relation to the economic aggregate (see Figure 4), Prague achieved 169% of the average for the Czech Republic (the highest allocations went to the districts of Kutná Hora - 257% and Prostějov - 170%, in both cases thanks to extraordinary investments in the defence sector). Highly uneven distribution of this expenditure illustrates well the fact that above-average values were achieved by only 13 districts, among which was also the second largest city (district Brno-město - 119 %).

Figure 4: Capital expenditure per economic aggregate after exclusion of transport infrastructure investments in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

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6.3. Capital expenditure in the transport sector

The extraordinary importance of investment devoted to the transport infrastructure is given by their very high volume (CZK 222 billion), which represents approximately 36% of the volume of the investment observed in this study. In addition, it is obvious that the regional formula of transport constructions, often linear in nature, may significantly differ from the spatial formula of other investment projects. For this reason, the transport sector was chosen for a separate regional analysis (i.e. investment in construction of motorways, expressways, railway corridors, and the underground in Prague). Despite a number of methodological constraints, it was possible to unite the two most important sources of funds for this sector: the state budget (i.e. ISPROFIN) and the State Fund for Transport Infrastructure. The total analysed investment volume of 1995–2005 exceeds CZK 222.3 billion (ISPROFIN – CZK 96.7 billion, the State Fund for Transport Infrastructure – CZK 125.5 billion), and the data are available only for NUTS 3 regions.

Figure 5 illustrates the considerably above-average allocation of investment in transport in Western Bohemia, which corresponds to the hypothesis of allocation of investment along a traditional west-east gradient in the level of socio-economic development. In transport investment, this gradient is raised by the effort to ensure transport connections for the Czech Republic or its capital of Prague with nearby economic centres in Germany (Munich, Frankfurt, Berlin). Although the area of Northern Moravia is a structurally affected region, as is North-Western Bohemia, transport investment has flowed more to Northern Bohemia in recent years, because the transport connection with Poland was of less priority than connections to Germany or Western Europe.

Figure 5: Transport infrastructure investment per capita in NUTS 3 regions, 1995–2005, Czech Rep. = 100 % (in %)

Source: ISPROFIN, SFTI, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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The spatial formula for the allocation of per capita investment in transport is very similar to the case where transport investment is related to GDP (the correlation coefficient is 0.954). In both indicators the position of Prague is well below national average (78%, resp. 38% of the Czech Republic average). On the contrary, Plzeňský, Olomoucký, Ústecký and Karlovarský regions achieved significantly above-average allocations. However, in evaluating the regional distribution of transport infrastructure investments (and of general investments as well) it is necessary to consider the time aspect in the sense that if a significantly higher amount of funds is granted to a region in a certain time range, it may mean that the necessary infrastructure had not previously been constructed in the region in question and it is being built behind schedule or out of needs arising from the different geopolitical orientation of the Czech Republic after the fall of the Iron Curtain. For example, as early as the communist era, the D1 motorway was completed between Prague and Brno, leading across the Vysočina region, so this region records a significantly below-average allocation, while in the districts of Tachov and Plzeň-jih districts, the D5 connecting Prague and Bavaria was built during the period considered here.

The regional distribution of capital expenditure after the exclusion of transport infrastructure investments when related to the economic level of the region (GDP) shows that transport investments are what "aid" economically weaker regions to reach above-average values. If transport investments are not considered, Prague is quite clearly the region that gains most

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from redistribution of public investment both in per capita terms and in relation to GDP (116 %, or 159 % of the Czech Republic average - see Table 5).

6.4. Capital expenditure allocated within explicit regional policy

Since one of the aims of this article is to show a significant discrepancy between the regional formula for the allocation of public investment funds within non-regional policies and regional policy, this is presented by Figure 6 which shows investments granted to explicit regional policy from the state budget. Strikingly, the funds allocated within regional policy are spread widely across the whole territory of the Czech Republic. This is in sharp contrast with the very conception of regional policy as a policy which supports only selected regions. This finding cannot be justified by changes of assisted areas over the investigated period as there was considerable stability of both the regional pattern of lagging and leading regions and consequently also of assisted areas delineated for the sake of regional policy (BLAŽEK, 2005b). On the other hand, the pattern of investment within regional policy does confirm that a certain priority was given to the assisted areas. Namely, the Moravian districts, especially the southern and, to some extent, northern ones ranked among the largest recipients of such investments (together with North-Western Bohemia they rank among the regions supported within Czech explicit regional policy, as does Northern Bohemia to some degree). Nevertheless, it is necessary to mention a paradox as a statistically highly significant positive relation of regional policy investment to regional GDP and to the economic aggregate was demonstrated for NUTS 3 regions (in both cases excluding Prague - see Table 6a). The same applies also to the level of NUTS 4 regions (see Table 6b) where a statistically significant positive relation was found between the regional policy capital expenditure and the level of economic development measured by the economic aggregate as a proxy for regional GDP. At the same time, a larger part of Moravia ranks, with other regions supported within explicit

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regional policy, as an area significantly underfinanced with respect to the total investment from the state budget after the exclusion of transport. In simple terms, districts supported within the explicit regional policy in the Czech Republic received only a very limited volume of investment from the national level (after the exclusion of transport constructions) (compare Figures 2, 3 and 4). On the other hand, support within Czech regional policy was significantly concentrated into these regions (see Figure 6). However, a huge difference in the financial sums invested has to be stressed again: CZK 7.2 billion for regional policy versus the total volume of the analysed funds amounting to CZK 617 billion. Nevertheless, although the volume of investments for regional policy at the national level is nearly negligible, its importance is significantly higher for the supported regions.

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Figure 6: Capital expenditure per capita from the state budget devoted to explicit regional policy in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %).

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Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Table 6a: Correlation of selected indicators for NUTS 3 regions (n=13 – Prague excluded)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

Table 6b: Correlation of selected indicators for NUTS 4 regions (n=76 – Prague excluded)

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.

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6.5. Capital expenditure for higher education, R&D and the environmental sector

Within the regional analysis of capital expenditure from the state budget of the Czech Republic, sectoral analyses were also carried out. As an example, Figure 7 shows investment

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from the state budget in the infrastructure of universities and colleges and other R&D institutions amounting to approximately CZK 25 billion. The expected regional distribution of such expenditure into economically more developed regions (Prague, Brno) and to regions where a public college is located, or to regions with headquarters of important research institutes (the Prague hinterland) was demonstrated (similar regional pattern of public R&D expenditure was shown by WISHLADE *et al.* 1996 or THE ESPON MONITORING COMMITEE 2005). Nevertheless, it is necessary to point out that it is not only capital expenditure from the central level that is devoted to this sector. For example, it was not possible to obtain data on the regional allocation of financial support for R&D projects allocated by the Grant Agency of the Czech Republic. In addition, it is necessary to take into account a frequent methodological problem, when some analysed data are allocated according to the headquarters of the institution in question, although such funds may then be invested in branches of the institution in a different region. It is thus probable that in fact investment in higher education and R&D is less concentrated than the data analysed shows.

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Figure 7: Capital expenditure per capita of the state budget devoted to universities and for R&D institutions in NUTS 4 regions, 1995–2005, Czech Rep. = 100 % (in %)

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Source: ISPROFIN, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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Figure 8 shows investment in the environment sector amounting to CZK 25.6 billion allocated both from the state budget and the State Environmental Fund. Although no clear relation between the distribution of funds and environmental quality has been shown, we may confirm to some extent that investment was allocated to regions in which it is necessary to solve a specific problem with respect to the environment (e.g. support of mining reduction, revitalising the river system, pond reconstructions).

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A surprisingly high allocation of investment to border districts in South-Western Bohemia relates to investment in the territorially largest national park in the Czech Republic (The Šumava National Park). Figure 8 provides, however, a surprising finding, that investment projects in the environment sector are not greatly concentrated in the structurally handicapped regions in Northern Bohemia and in Northern Moravia where the environment is seriously damaged. There is one exception with high investment - the Česká Lípa district - where the running down of the uranium industry and subsequent cultivation of the area are jointly in progress.

Figure 8: Environmentally related capital expenditure per capita of the state budget in 1995–2005 and of the State Environmental Fund in 1999–2005 in NUTS 4 regions, Czech Rep. =100 % (in %)

Source: ISPROFIN, SEF, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

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6.6. Relation of capital expenditures to selected socio-economic variables

On the basis of correlation coefficients for selected indicators for NUTS 3 regions (Table 6a) we can demonstrate a statistically significant relation between all regional allocations of investment via all analysed categories of investment (i.e. total investment, total investment after exclusion of transport investment, transport investment, investment into R&D and universities and regional policy investment, and their economic performance expressed by the GDP and the economic aggregate. The same finding counts for correlation coefficients for NUTS 4 regions (Table 6b), however, due to data limitations only the correlation between 3 investment categories and the economic aggregate could be calculated. It is important to stress again that with respect to the declared objectives of Czech regional policy, the correlation

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between the share of investment allocated within explicit regional policy and economic performance should be negative. However, on both NUTS 3 and NUTS 4 level regions positive and even statistically significant values were obtained indicating that even allocation of investment within regional policy is not in line with its own strategic objective.

The identification and detailed assessment of factors behind these observed patterns goes beyond the focus of this paper, however at least a brief discussion should be included. In countries like the Czech Republic which are lacking instruments for the systematic evaluation of the effectiveness and efficiency of planned public investment, a relatively important role can be assumed for subjective factors. The decision making process on public investment committed from the central level basically proceeds at two levels. Firstly, on the basis of a proposal of the Ministry of Finance, the Government and Parliament decide about financial allocations to particular sectors that come under the responsibility of particular ministries. Secondly, there is a process of selection of priorities by a particular ministry. In this case, three main factors influencing the decision making process on public investments might be identified: i) the adopted strategy for a specific sector (inevitably even these strategic documents can to some extent reflect subjective factors), ii) the interests of (esp. high-ranking) public servants and iii) the interests of politicians. On the basis of our experience of more than 10 years of contractual cooperation by one of the authors with one central administration body we can draw two preliminary conclusions. First, the relevance of these three types of factors differs widely among different sectoral policies. Second, in some cases each of the three above mentioned factors can be decisive. This, therefore, makes a clear case for the introduction of some instruments (including TIA) that would be able to "objectivise" the need for public investment.

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7. Conclusions and policy implications

The article aims to contribute to the debate on the regional dimension of sectoral (non-regional) governmental policies and to empirically demonstrate the huge discrepancy between both the volume and regional pattern of public capital expenditure committed within the national sectoral policies on the one hand and the official regional policy on the other. The performed analyses focused "only" on the public capital expenditures allocated by the Government of the Czech Republic, but it can be claimed that public capital investments have the most important implications for the development of particular regions (SHORT, 1981; YAMANO and OHKAWARA, 2000). Obviously, the financial volume of the total public capital expenditure is incomparably higher than the financial volume allocated to explicit regional policy.

The regional analyses performed were based on the dataset of public capital expenditure in the Czech Republic covering the years 1995–2005 and demonstrated uneven regional distribution of these investments in favour of the most economically developed region of the Czech Republic – the capital city of Prague. Such a regional pattern for the distribution of public investment supports the hypothesis that there exists a contradiction between the regional impact of sectoral policies on the one hand, and the goals of explicit regional policy on the other. The discrepancy between these two is particularly striking as assisted regions delineated for the sake of national regional policy were to a large extent left aside by decisions regarding the allocation of public capital expenditure (with the exception of expenditure on transport infrastructure). Moreover, a surprising pattern was identified even in the case of investment committed within explicit regional policy (Fig. 6) which is not coinciding well with the map of assisted areas (Fig. 2). Clearly, the allocation of regional policy investments is not respecting fully the objectives of regional policy itself.

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Consequently, there is a clear conflict between the goals of explicit regional policy aiming at the support of less well-off regions and mostly unintended regional impacts of much more vigorous non-regional governmental policies generally supporting the most developed regions. These findings are in line with research performed by e.g. WILSON and WISE (1986) but in contrast with results of YAMANO and OHKAWARA (2000).

However, it is necessary to stress that from the point of view of the entire expenditure side of the governmental policies comprising both capital and current expenditure, the region of Prague is very likely the most important net payer into the system of public finance due to its buoyant tax base and to its relatively low share of persons receiving social benefits (see OUŘEDNÍČEK and NOVÁK, 2006). Nevertheless, it is clear that the uneven distribution of public capital expenditure, generally favouring more developed regions, is one of the most important mechanisms of regional differentiation and is, moreover, cumulative in nature.

The expectation of a replication of the traditional East-West gradient in the level of socio-economic development by the regional structure of total capital expenditure has not been experienced. However, the evidence supporting this expectation can be observed in the case of the capital expenditure allocated to transport infrastructure. The greater support of transport infrastructure projects in the Western part of the Czech Republic is a reflection of the priority assigned to connecting the Czech Republic to Western European structures.

Key implications deriving from the conducted regional analysis relate in particular to the necessity of developing a sound methodology for the territorial impact assessment of public policies and programmes. In other words, it is essential to develop a procedure evaluating not only the regional impact of incentives carried out within explicit regional policy (which is

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already becoming common practice in the most developed countries) but also the impact of public interventions which do not explicitly incorporate a regional dimension but where implementation might have a significant regional impact. Such an evaluative instrument is essential for tackling of regional development issues and problems more effectively by achieving synergies and eliminating contradictions between different policies (SCHÄFFER, 2005; CEC, 2006a, 2006b). Nevertheless, this approach is a real challenge due to the fact that public policies in most advanced countries are traditionally being implemented via sectorally structured public administration at central governmental level while the relevance of sectoral policies for development of particular regions has been clearly underestimated (ROBERT *et al.*, 2001; MACEŠKOVÁ, 2007).

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Despite the effort that has been put into developing TIA methodology, no comprehensive and satisfactory tool for regional impact assessment has yet been developed. Therefore, as also documented by our empirical results, which showed both an uneven spatial pattern of the allocation of public capital expenditure and a huge mismatch between the regional pattern of this expenditure and the assisted regions, the development of a suitable instrument for territorial/regional impact assessment and its application at least to the most relevant sectoral policies remains a critical challenge for both researchers and decision-makers.

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[i] Such fine-tuning can take many different forms, for example differentiation of the form and the rate of public support or the involvement of regional self-government or other regional bodies in decision-making procedures, although in practice such an approach is rather rarely applied.

[ii] Except for the programmes set by a special act such as state support to the national cultural heritage or agriculture.

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Regional accounts – Czech Statistical Office

236x87mm (300 x 300 DPI)

158x98mm (500 x 500 DPI)

175x98mm (300 x 300 DPI)

158x97mm (300 x 300 DPI)

159x98mm (300 x 300 DPI)

160x97mm (300 x 300 DPI)

163x97mm (300 x 300 DPI)

161x97mm (300 x 300 DPI)

Table 1: Expenditure of the Czech state budget in 1995-2005 (current prices, in billion CZK, in %)

	1995	1996	1997	1998	1999
Total expenditure of the state budget	432.7	484.4	524.7	566.7	596.9
of which capital expenditures of the state budget	44.1	46.4	50.6	50.5	59.0
share of capital expenditures of the total expenditure of the state budget (%)	10,2	9,6	9,6	8,9	9,9

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.
Note: In December 2007, the exchange rate was approx. 1 EUR = 27 CZK.

Table 1 continued

	2000	2001	2002	2003	2004	2005
Total expenditure of the state budget	632.3	693.9	750.8	808.7	862.9	843.8
of which capital expenditures of the state budget	60.9	49.6	49.7	56.9	66.7	79.0
share of capital expenditures of the total expenditure of the state budget (%)	9,6	7,1	6,6	7,4	7,7	9,4

Source: Statistical Yearbook of the Czech Republic 1997, 1999, 2001, 2002, 2004, 2006.

Table 2: Expenditure from selected state extra-budgetary funds in 2000-2005 (current prices, in billion CZK)

	2000	2001	2002	2003	2004	2005
Total expenditure of the State Environmental Fund of the Czech Republic	2.9	3.8	4.2	4.8	4.2	3.4
of which capital expenditure of the State Environmental Fund of the Czech Republic	2.6	3.5	3.7	4.2	3.7	3.0
share of capital expenditure of the entire expenditure of the State Environmental Fund of the Czech Republic	89.7	92.1	88.1	87.5	88.1	88.2
Total expenditure of the State Fund for Transport Infrastructure	8.5	30.6	40.2	41.3	52.1	48.5
of which the capital expenditure of the State Fund for Transport Infrastructure	5.0	13.9	24.1	25.1	34.6	37.8
share of capital expenditure of the entire expenditure of the State Fund for Transport Infrastructure	58.8	45.4	60.0	60.8	66.4	77.9

Source: Statistical Yearbook of the Czech Republic 2000 - 2006.

Table 3: Financial resources of ISPROFIN 1995-2005 (in billion CZK, current prices in %)

ISPROFIN	billion CZK	share of the total sum of ISPROFIN (in %)
Total	658.9	100.0
Included into analysis	478.5	72.6
Totally excluded from the analysis	180.3	27.4
of which regional allocation unknown	81.7	12.5
allocation abroad	6.1	0.9
current expenditures	37.7	5.7
extraordinary expenditures	14.7	2.3
other specific capital expenditures - e.g. purchase of fighter aircraft	39.5	6.0

Source: ISPROFIN, authors` calculations.

Table 4: Overview of the analyzed data for the period 1995-2005 (in billion CZK, current prices)

Thematic sphere of capital expenditure	Financial volume	Source	Level
Total capital expenditure	617.2	State budget (ISPROFIN), SFTI, SEF	NUTS 3
Capital expenditure excluding transport infrastructure investments	394.9	State budget (ISPROFIN), SEF	NUTS 3 NUTS 4
Transport infrastructure investments	222.3	SFTI, State budget (ISPROFIN)	NUTS 3
Explicit regional policy and regional development	7.2	State budget (ISPROFIN)	NUTS 4
Environmental capital expenditure	25.6	SEF, State budget (ISPROFIN)	NUTS 4
Capital expenditure devoted to universities and R&D	25.4	State budget (ISPROFIN)	NUTS 4

Source: ISPROFIN (Internal material of the Ministry of Finance of the Czech Republic), Internal materials of the State Fund for Transport Infrastructure (SFTI) and the State Environmental Fund (SEF), authors` calculation.

Table 5: Capital expenditure per capita and related to regional GDP (1995-2005, in %)

Region	Total investments in bln CZK	Total investments per capita Czech Rep. = 100 %	Total investments excluded of transport infrastructure investments per capita, Czech Rep. = 100 %	GDP per capita, Czech Rep. = 100 %	Total investments per GDP, Czech Rep. = 100 %	Total investments excluded of transport infrastructure investments per GDP, Czech Rep. = 100 %	Transport infrastructure investments per GDP, Czech Rep. = 100 %
Prague	168.3	237	326	206	116	159	38
Central Bohemia region	55.9	84	76	95	86	78	100
South Bohemia region	29.2	78	66	89	87	74	109
Plzeňský region	42.3	128	89	94	136	95	209
Karlovarský region	13.1	71	44	80	89	55	150
Ústecký region	45.3	91	53	82	111	64	194
Liberecký region	21.9	85	85	83	102	103	102
Královehradecký region	22.6	68	78	90	76	86	57
Pardubický region	23.6	77	66	84	92	78	116
Vysočina region	18.8	60	67	87	69	78	54
South Moravia region	61.6	90	93	93	98	101	93
Olomoucký region	40.9	106	87	77	137	113	181
Zlínský region	19.9	55	57	82	68	71	64
Moravskoslezský region	53.9	70	51	80	89	65	131
Czech Republic	617.2	100	100	100	100	100	100

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, authors` calculations.

Table 6a: Correlation of selected indicators for NUTS 3 regions (n=13 - Prague excluded)

	Regional share of GDP	Regional share of economic aggregate	Regional unemployment rate	Regional share of total investment	Regional share of transport investment	Regional share of investment excluding transport	Regional share of investment in universities and R&D
Regional share of economic aggregate	0,993						
Regional unemployment rate	0,304	0,357					
Regional share of total investment	0,906	0,910	0,399				
Regional share of transport investment	0,717	0,741	0,634	0,892			
Regional share of investment excluding transport	0,905	0,890	0,097	0,903	0,612		
Regional share of investment in universities and R&D	0,583	0,592	-0,001	0,618	0,323	0,775	
Regional share of expenditure on regional policy	0,782	0,818	0,547	0,710	0,573	0,698	0,617

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.
Note: Critical value of correlation coefficient for 95% level of significance is 0,497.

Table 6b: Correlation of selected indicators for NUTS 4 regions (n=76 - Prague excluded)

	Regional share of economic aggregate	Regional unemployment rate	Regional share of investment excluding transport	Regional share of investment in universities and R&D
Regional unemployment rate	0,111			
Regional share of investment excluding transport	0,851	-0,009		
Regional share of investment in universities and R&D	0,822	-0,039	0,915	
Regional share of expenditure on regional policy	0,320	0,404	0,228	0,122

Source: ISPROFIN, SFTI, SEF, Czech Statistical Office, Statistical Yearbook of the Czech Republic 2001, HAMPL (2005), authors` calculations.
Note: Critical value of correlation coefficient for 95% level of significance is 0,200.